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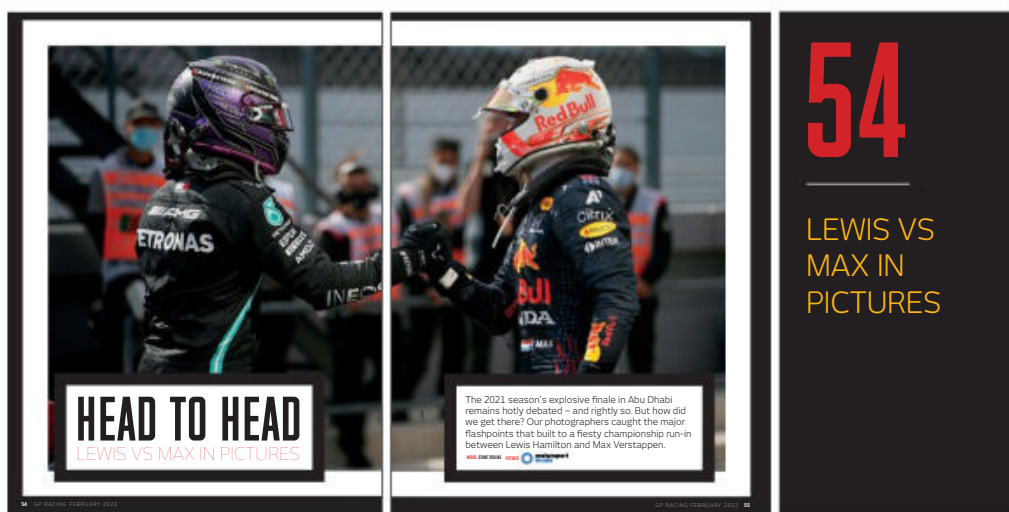
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Ben
Anderson
@BenAndersonF1



An unacceptable finish to an amazing season

'The lap that decided a championship'.

This neat summary of the Abu Dhabi GP by our art editor, Frank Foster, would ordinarily be cause for near-universal celebration. The title settled on the final lap of the season – what a time to be alive!

But this was no ordinary season. This is an age of polarisation; divisions amplified and solidified by the toxic power of unfettered and irresponsible social media. It's true in F1 as it is in life. Lewis Hamilton, Max Verstappen, Mercedes and Red Bull tore lumps out of each other – on track and off – creating an atmosphere of mutual distrust and resentment, which spilled beyond the paddock.

Regardless of where you personally sit on the fence that divides these two camps, we can all agree they raced incredibly hard and created a fantastic spectacle. Each were worthy champions, regardless of the actual results.

What isn't acceptable is how that final lap showdown came to pass. Honestly, it made a mockery of F1 – just when it had drawn the eyes of the world upon it.

This was a rare occasion where F1 transcended its usual audience, but the most important race in F1 for nearly a decade ended in confusing and farcical scenes: rules not followed, regulated procedures altered on a whim, the race apparently "manipulated" (Hamilton's word) to create a better spectacle for TV.

All of which meant the best F1 season for ages

ended with a protested result, more rancour, more division, and worse – F1 itself looking stupid, like it doesn't know how to follow its own rules.

Football fans will roll eyes and say this sort of thing happens all the time. Manchester City manager Pep Guardiola even compared events in Abu Dhabi to refereeing decisions that unjustly go against football clubs. What's done is done. There's nothing you can do except move on.

But this didn't feel like a simple mistake. This felt like Michael Masi making it up as he went along – somehow desperate to create a grandstand finish instead of letting the race peter out. A laudable aim, you might say, but I always think sport should come first and 'the show' second. One should naturally lead to the other, and if it doesn't quite work out that way so be it. This is F1, not WWE.

Rules are rules, and referees are meant to enforce them. Sure, if regulations or procedures need changing, change them – but not while the competition is still going on and the ultimate prize is still at stake.

As Jean Todt completed his farewell tour as FIA president, the governing body admitted events in Abu Dhabi created "significant misunderstanding" while "tarnishing the image of the championship", pledging a "detailed analysis and clarification exercise" ahead of the coming season.

First point of order should probably be: 'don't allow your officials to make it up as they go along'.

Contributors



ANDREW BENSON

Andrew analyses how Max Verstappen managed to come out ahead of Lewis Hamilton in one of F1's craziest title battles (p40)



ADRIAN MYERS

Adrian visited Brackley to shoot portraits for our Mercedes feature on the team's technical efforts in 2021 (p66)



MARK GALLAGHER

This month Mark talks with Jacques Villeneuve about his title success, 25 years on, and the influence his father had on his career (p92)



LUKE SMITH

Luke stayed in Abu Dhabi for F1's post-season test, and his take on the new 18-inch wheels and the drivers on show is on page 30

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The rising sun's parting shot

I know Honda has said it's never going to return to Formula 1, but I really hope the company changes its mind at some point down the line. I can think of fewer organisations more passionate about racing, and the decision to bring forward developments originally planned for 2022 has paid off.

This is straight after parc fermé, as you can tell by the fact that Max still has his crash helmet on – he literally legged it towards the team after getting out of the car and I had to run after him with my gear in tow. This is a historically significant moment and you can see what it means to all involved, not least Mr Yamamoto on the left.



Photographer
Steven Tee

Where Yas Marina, Abu Dhabi

When 6:41pm, Sunday
12 December 2021

Details Canon EOS-R5
24-105mm lens, 1/400 @ F8









What a view to a thrill

One of the bonuses of shooting on behalf of the Abu Dhabi Grand Prix promoters is that you get access to viewpoints no other photographers have. In this case it's the grandstand at the end of the back straight, the idea being to demonstrate to putative ticket buyers the quality of the view they're going to get.

It was one of the best seats in the house and an overhead perspective on one of the most significant points in the race. Here Max Verstappen lunges inside title rival Lewis Hamilton at Turn 6 on lap one, Max trying to regain the lead after fluffing the start. A controversial trip across the run-off area for Lewis would follow...



Photographer
Simon Galloway

Where Yas Marina, Abu Dhabi

When 5:02pm, Sunday
12 December 2021

Details Nikon D6
24-70mm lens, 1/1250 @ F4

A joyous end to the bull run

I felt like Max was curiously muted in the immediate aftermath of the race, almost as if he couldn't believe he'd done it and won the world championship – or that he had, but was half expecting it to be taken away from him again, what with the post-race brouhaha.

Patience paid off – over an hour after the end of the race, Max emerged from his interviews and got down to a proper celebration with his crew. Red Bull's mechanics are as competitive a bunch of people as you're ever likely to meet. They're absolutely dedicated to Max and this win meant the world to them – the joy is written all over their faces.



Photographer
Mark Sutton

Where Yas Marina, Abu Dhabi

When 8:10pm, Sunday
12 December 2021

Details Nikon D6
14-24mm lens, 1/800th @ F2.8





Joining the movers and shakers

When Red Bull went over to the matt effect paintwork for the 2016 season there were those who declaimed it as a backwards step, but I've never had a problem with it. In fact, Red Bull's livery is a nice mix of strong colours and it really lends itself to dramatic action shots where you use slow shutter speeds to produce a motion blur. And you're going to see more of them as photographers shift over to Canon's excellent new mirrorless R5, which can go slower than I thought possible.

Max's driving style lends itself to dramatic imagery. I got this shot in Q3, where he produced a lap that was special even by his high standards.



Photographer
Steven Tee

Where Yas Marina, Abu Dhabi

When 5:58pm, Saturday
11 December 2021

Details Canon EOS R5
70-200mm lens, 1/4th @ F201





The achievement of a lifetime

Way back in 2008, around the back of the McLaren garage after the race at Interlagos, I found Lewis Hamilton and his father having a quiet moment together after Lewis won his first world championship. It was beautifully poignant and I was very pleased to capture a similar scene between Max and Jos Verstappen in the aftermath of the Abu Dhabi GP.

They were behind one of the huge LCD boards F1 now uses as a backdrop for the post-race interviews in parc fermé, but I saw a TV cameraman shooting the scene so I thought I'd investigate. For me it encapsulates the emotion of achieving a long-held ambition.



Photographer
Steven Tee

Where Yas Marina, Abu Dhabi

When 6:48pm, Sunday
12 December 2021

Details Canon EOS R5
24-105mm lens, 1/60 @ F6.3





WHY F1 MIGHT BE OVER FOR HAMILTON

01 **The FIA has set out its process** for an investigation into the Abu Dhabi Grand Prix farrago, and the outcome will have a significant influence on whether Lewis Hamilton remains in Formula 1.

In January, *GP Racing* contributor and BBC Sport's chief F1 writer Andrew Benson reported that Mercedes insiders say Hamilton has "lost trust" in the governing body because of its handling of the race, and will not decide whether to return to F1 until he sees the results of the inquiry. This will be the first big test of the authority of newly elected FIA president Mohammed Ben Sulayem.

Inevitably, given the circumstances, discussion of this matter has been driven down several rabbit holes by partisanship. But this is not a question of who won and who lost, but one of whether the rules were correctly applied – and it is fundamental to the ongoing credibility of F1 as a sporting spectacle.

At the heart of the controversy lie the actions of race director Michael Masi during the final laps – decisions which had a direct bearing on the outcome of the race and the drivers' championship.

Hamilton was leading the Abu Dhabi Grand Prix, victory in which would earn him an eighth world title. With six laps to run, the Safety Car was deployed after Nicholas Latifi spun his Williams into the barriers in the twisting section under the Yas Viceroy hotel, an area of the track which is difficult to access. Red Bull had nothing to lose by pitting second-placed Max Verstappen for fresh tyres, but Mercedes could not do the same for Hamilton, since he would concede track position to Verstappen at a point when it was uncertain whether the race would finish behind the Safety Car.

Masi, who was being lobbied over the radio by senior representatives of both leading teams, then appeared to discard two key elements of the FIA's rulebook to ensure the race finished under green-flag conditions. While it is optional to allow lapped cars to un-lap themselves ahead of the restart – so that drivers actually racing one another are together on track – Masi took the unprecedented step of allowing only the five cars between Hamilton and Verstappen to unlap themselves on the penultimate tour. All the others, including the two between Verstappen and third-placed Carlos Sainz, were directed to remain in place.

With just one lap remaining, Masi then restarted the race – against the rules, which explicitly state the race should restart at the end of the lap following the one in which lapped cars have been cleared. The tyre offset,



Lewis Hamilton waved to the crowd after the Abu Dhabi GP (above). This could turn into a goodbye wave from F1, if he doesn't have faith in the results of the FIA's inquiry into the procedures that followed Nicholas Latifi's spin (below), and subsequent Safety Car (right)



PICTURES: SAM BLOXHAM; STEVE ETHERINGTON; FRANCIS VERMUELEN



coupled with the absence of lapped cars between them, enabled Verstappen to easily pass Hamilton for the win and the world championship.

Mercedes naturally raged, and lodged a protest. Other teams also had cause for complaint, though they did not make it official. Ferrari nearly lost a podium position because Sainz had two lapped cars ahead and the AlphaTauris of Yuki Tsunoda and Pierre Gasly behind, both on fresh tyres. McLaren expressed disappointment, having pitted Daniel Ricciardo from 11th place for fresh tyres, only for lapped traffic to prevent him gaining advantage from the new rubber.

The reaction from the fan community was explosive – and, while many opinions expressed fell along tribal lines, the fact remained the race director failed to apply the rules correctly while intervening in a manner which affected the result.

When the stewards threw out Mercedes' protest, citing Article 15.3 of the sporting regulations (which was read by the stewards and Red Bull as giving the race director "overriding authority" over the Safety Car procedure), the anger reached yet higher peaks.

It's understood that Hamilton's loss of trust in the governing body is a result not just of the race, which he described as "manipulated", but also the way the FIA initially closed ranks and brushed off criticism. The FIA later admitted that events on the day were "tarnishing the image of F1".

Mercedes appealed against the stewards' decision, then dropped the appeal. The BBC reports that it did so having reached an agreement with the FIA that Masi and head of single-seaters Nikolas Tombazis (architect of the aerodynamic rule changes implemented in 2021 that cost Mercedes significant car performance) would be removed from their posts ahead of the 2022 season.

Ben Sulayem, who triumphed over Graham Stoker (seen

as the 'continuity candidate' for outgoing president Jean Todt in FIA elections last December), has stressed the need for the governing body's response to be "proactive, not reactive".

His position has shifted quickly since he took office. Having taken on the presidency, Ben Sulayem initially maintained the Todt regime's protective line over the events of the season finale. Ben Sulayem even went so far as to suggest

A BLANKET INSISTENCE ON THE RACE DIRECTOR'S ABSOLUTE AUTHORITY TO IGNORE THE RULES AS HE SEES FIT PUTS F1'S CREDIBILITY IN JEOPARDY

Hamilton should be investigated and possibly punished for declining to attend the FIA prizegiving gala, as is mandated.

That outlook changed as it became evident the FIA had failed to read the room: a blanket insistence on the race director's absolute authority to ignore the rules as he sees fit puts F1's credibility in jeopardy. And while there are certain elements of the fan spectrum who would view Hamilton's potential departure as a petulant flounce, losing F1's most bankable star would damage its credibility even further and have massive commercial implications.

Ben Sulayem revealed he has attempted to contact ►

Hamilton but no reply was forthcoming: “I don’t think he’s 100% ready to respond right now. We don’t blame him. I understand his position.”

Little wonder that the new FIA president has pivoted towards a policy of engagement, and of solving the problem of the Abu Dhabi GP rather than dismissing it. One of his first steps was to appoint FIA secretary general for motorsport Peter Bayer as executive director of single-seaters, and put him in charge of the Abu Dhabi inquiry. This is a significant political development since it effectively sidelines Tombazis.

Bayer’s remit includes “proposals to review and optimise the organisation of the FIA F1 structure for the 2022 season”. As this issue of *GP Racing* closed for press he was due to hold talks over the use of the Safety Car with sporting directors from all F1 teams at a meeting of the FIA’s sporting advisory committee. Bayer will then have “a shared discussion with all F1 drivers” based on the outcome of that meeting.

“The outcome of the detailed analysis will be presented to the F1 Commission in February,” said the FIA in a statement, “and final decisions will be announced at the World Motor Sport Council in Bahrain on 18 March.”

The March date – the Friday of the season-opening Bahrain GP – is rather late in the day for Hamilton to make a decision. But the FIA has confirmed he will have the opportunity to be part of the drivers’ meeting with Bayer. The F1 Commission meeting will also provide a strong indicator of the outcome; no date has been set but it is likely to be in early February, before pre-season testing commences.

Whether or not a new race director is appointed, an overhaul of the decision-making mechanism and the communications which surround it is likely. Last year, for the first time, F1 was able to broadcast some of the radio traffic between team pitwalls and race control; it’s believed certain team members took to lobbying more



New president Mohammed Ben Sulayem (top right) has appointed Peter Bayer (right) to run the FIA’s Abu Dhabi GP inquiry, where the role of race director Michael Masi (above) will be under intense scrutiny



assertively, knowing the commercial rights holder would find the controversy irresistible.

“It’s not only a decision to change the race director,” said Mercedes F1 boss Toto Wolff. “The whole system of decision-making needs to be improved. The race director is certainly under big pressure and some of that is due to our own faults.”

NEW FACES AT ASTON AND ALPINE

Longstanding Aston Martin team principal Otmar Szafnauer has been replaced by former head of BMW Motorsport Mike Krack. Changes have been expected at the Silverstone team ever since owner Lawrence Stroll rebranded it at the beginning of 2021 and began a c-suite recruitment drive across the broader Aston Martin Group, including the appointment of former McLaren boss Martin Whitmarsh.

Szafnauer’s position had been in doubt for several months, and rumours emerged during F1’s late-season flyaway leg that

02

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PICTURES: SIMON GALLOWAY; ANDY HONE; FORMULA 1
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he had handed in his notice and would be moving to Alpine. These were denied at the time, and Szafnauer described them as “pure media speculation and not based on fact”. He has worked for the Silverstone F1 team for 13 years, arriving during its Force India incarnation when then-owner Vijay Mallya had a management clear-out shortly after acquiring it.

Krack is no stranger to the sharp end of motor racing, having worked as an engineer in single-seaters, the DTM and the World Endurance Championship. As head of BMW Motorsport, he oversaw the company’s involvement in US sportscar racing as well as Formula E. But BMW has massively stepped down its commitment to motor racing in recent years, a policy with which Krack will be familiar: he was head of trackside engineering during the BMW-Sauber years, leaving the company in 2009.

Alpine is also making changes, though whether this involves the long-expected arrival of Szafnauer is yet to be seen. The departure of executive director Marcin Budkowski was announced in a perfunctory press release in mid-January. It is only a year since Alpine ejected former team principal Cyril Abiteboul during the course of a management reshuffle in which Laurent Rossi was appointed CEO, former MotoGP man Davide Brivio was handed the new role of racing director, and Budkowski became the third member of the senior management triumvirate as executive director.

Although Budkowski’s brief was to take charge of the research and manufacturing side at Alpine’s Enstone HQ, he was a regular feature on the pitwall in 2021. In interviews he alluded to this being a necessity as Brivio “got up to speed” with F1, and rumours have persisted that Brivio is likely to return to MotoGP.

When Rossi announced in December that another management restructure was in the offing, it was assumed that Brivio would be the victim rather than Budkowski. Alpine said that Rossi would “temporarily ensure the team’s management to allow everyone to focus on the next season’s preparation”.

Alpine has also bid farewell to four-time world champion

Alain Prost, who has been a consultant since 2015 and a non-executive director since 2019. Speaking to *L’Equipe*, he said he had been sidelined in the decision-making process by Rossi, who “told me he no longer needs advice”.



Former BMW Motorsport man Mike Krack is Aston’s new team principal...



... replacing Otmar Szafnauer, who could be on his way to Alpine...



... which has dispensed with the services of Marcin Budkowski...

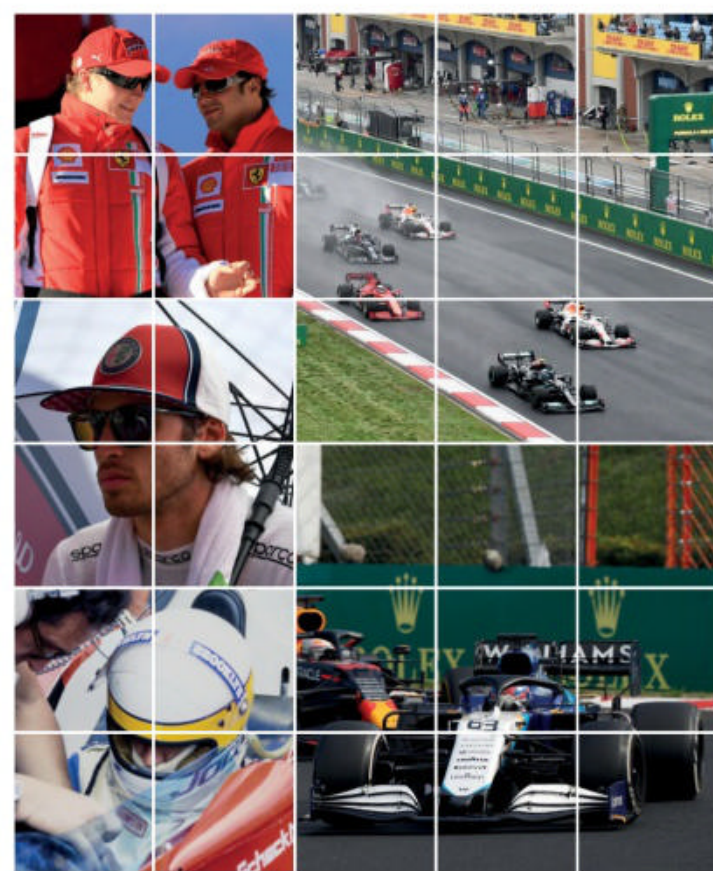


... but not sporting director Davide Brivio, as was widely rumoured

F1 MASTERMIND

Your chosen specialised subject: the world’s greatest motorsport

- Q1** How many different team-mates did Kimi Räikkönen race with in his F1 career: 13, 14 or 15?
- Q2** Sprint races were held at three GPs in 2021, but which one of the three had no retirements?
- Q3** Who had more front row starts in 2021: Max Verstappen or Lewis Hamilton?
- Q4** Antonio Giovinazzi finished once inside the top six, from 62 starts. Which race was it?
- Q5** Three Englishmen won world championship races driving a Lotus. Who were they?
- Q6** How many of Valtteri Bottas’ 10 full race wins as a Mercedes driver came from pole position?
- Q7** True or false: Williams had both cars in the points at consecutive races in 2021, for the first time since Singapore and Malaysia in 2017?
- Q8** Britain and Silverstone hosted the first F1 GP in 1950, but which country and circuit got the 1951 season underway?
- Q9** Sebastian Vettel claimed Toro Rosso’s only win and pole position at Monza in 2008, but which driver recorded the team’s only fastest lap?
- Q10** Jody Scheckter and which other two drivers led the championship during the 1979 season?



1 13 São Paulo **3** Hamilton (15 to 14) **4** Brazil, 2019 (finished fifth) **5** Graham Hill, Innes Ireland and Stirling Moss **6** 7 False, it was Belgium and Italy in 2016 **8** Switzerland, Bremgarten **9** Danil Kvyat (Spain, 2016) **10** Jacques Laffite and Gilles Villeneuve



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THE F1 ANALYST

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PICTURES 

approach has been brilliant in recent years, and although he will have suffered a momentary dip, the fact he is a seven-times champion backed by a team that supports him to such a level will surely give him the resolve and passion to return to battle.

Within Mercedes itself the team mindset will also readjust as George Russell replaces Valtteri Bottas. A new pairing, a young driver of immense talent joining the established standard-bearer, will create a fresh dynamic. Intense competition to push one another and help develop a new car will be a positive aspect, but that internal rivalry may also distract and deplete. At Red Bull, Max continues with the benefit of proven supporter Sergio Pérez alongside.

Abu Dhabi served up other mental shifts; Carlos Sainz surged ahead of both his team-mate Charles Leclerc plus friend and rival Lando Norris to finish fifth in the championship, the highest non Red Bull and Mercedes driver in the standings. It was an inspiring way to complete Sainz's first season at Ferrari, and it will have given him an extra kick of confidence going into this new era of car design. Such a positive recovery from a dire season in 2020 has confirmed that team principal Mattia Binotto has moulded Ferrari together well, but his

signature dish will be the car of 2022 and the team's chances of fighting for a title will be key to his future.

Yuki Tsunoda was another driver who enjoyed an almost perfect mental lift to conclude what had been a tough debut season. It started impressively in Bahrain but dropped away quickly and it took the Japanese racer time to reset. In Abu Dhabi he delivered, with sixth place on the cards before the last-minute dramas, elevating him to a season's best fourth place at the finish. With Pierre Gasly staying on board, the AlphaTauri team has a good combination for the coming season.

Mindsets are adjusting – some subtle, others significant – going into this new campaign. And it is possible there could be a re-jig for all of us watching the action. Last year we saw both championship contenders go wheel-to-wheel on more occasions than expected, but as a friend and knowledgeable fan pointed out to me, their battles usually ended with a single move. What we have missed for so long is watching F1 cars pass and repass over a number of laps, and that is something which has the potential to return under the new technical regulations.

It may take a while for teams to maximise these latest creations, but just watch the replay of Gilles Villeneuve racing Rene Arnoux in the final laps of the French Grand Prix at Dijon in 1979 (it's on *YouTube*) and savour the thought of F1 going down that route. Mentally, I'm in a different zone already...

A SHIFTING OF MINDSETS FOR A NEW SEASON?

The final laps of the Abu Dhabi Grand Prix shifted thoughts for all of us who had been engrossed in such an unpredictable season. From assuming near the end that Lewis Hamilton would become an eight-time world champion, to watching Max Verstappen take his first title, the result changed our perception and future outlook on Formula 1 in subtle ways. Yet for those who were actually putting on the show, especially the two competing gladiators, the mental shift could be far more significant.

Verstappen's father Jos has often reported his surprise that Max can cope with the pressures of competing at the highest level in such a relaxed way, but tension was written through Max's eyes going into that final race. He maintained a settled style of communication with the people around him, but it was clear just how much winning the title mattered – and it did not start well. The poor getaway, the arguably over-committed attack on the first lap and then the sheer pace of the Mercedes dented his chances significantly.

Max's commitment didn't waver but there must have been a space in the back of his mind with ten laps to go, containing the emptiness of not winning the title after such an incredible year, and perhaps a hint of despair.

Yet the turnaround caused by Nicholas Latifi's accident and Max's subsequent dramatic victory will have made a permanent change to that mindset. To become a champion, to actually achieve that incredible goal, to establish in his mind that he can do it no matter what appears to be going wrong around him, all of these elements will now build an even more confident and resolute character in someone who is still only 24 years old.

How different to the mental perspective of Nico Rosberg, the last driver before Verstappen to have beaten Lewis to the title. Within days of Nico's success, we heard he was retiring, as he felt the personal sacrifice required of him to beat Hamilton was unsustainable at the age of 31. Such moments are trigger points, and for Verstappen this positive switch could well be the start of a dominant era.

How will it have affected Hamilton? That's much more difficult to assess. Mark Webber recognised a slight uncertainty in Hamilton's head about the future of his career in F1 after suffering such a difficult episode, and indeed Toto Wolff has described Lewis as "disillusioned" with F1, perhaps to the point of no return.

Now that Lewis has been able to sit back and ponder, surely he will recognise he could not have done anything better in that final race. His mental

After an inconsistent debut season, Yuki Tsunoda ended the year well with a fourth place finish in Abu Dhabi



Max Verstappen's confidence will be sky high after he claimed his first title in Abu Dhabi. But it could have been so different...



Lewis Hamilton will need to call on all of his resolve to recover from the disappointment of failing to win his eighth title



Carlos Sainz ended 2021 as the 'best of the rest', the highest-placed non Red Bull or Mercedes driver in the championship, in the Spaniard's first season at Ferrari



Mattia Binotto refocused Ferrari in 2021 after an awful 2020, but only fighting for titles will do for the Scuderia



Mercedes will have a different dynamic in 2022 with George Russell as Lewis Hamilton's new team-mate

Pierre Gasly, one of the most consistent performers in 2021, will again be crucial to AlphaTauri's hopes





UNDER THE HOOD

PAT SYMONDS

PICTURES  **motorsport** IMAGES

With all these caveats, probably the best way of establishing performance is by matching simulation to actual track data. This is done by comparing the speed profile of a virtual car with that measured during the race weekend. By adjusting parameters such as downforce, drag and engine performance one can start to eliminate some of the unavoidable variables found in raw data.

It is a mathematical fact that in order to determine any number of variables one needs at least one more equation than there are variables, and this leads to a problem in this case. Some of the variables, while very different in themselves, produce similar effects. For example, drag and engine power both determine top speed; grip

and downforce both determine cornering speed. This makes it difficult to separate all factors, but over a season an iterative approach allows a reasonable degree of accuracy in determining performance.

Certain aspects can be regarded as constants. For example, one would not expect engine performance to vary unless a new engine or a new fuel was introduced. As these types of events are known, they can be inspected separately.

With very few significant improvements made to suspension these days one might think that tracking performance through the season would now show clearly how each team's aerodynamic research was paying off, as this is by far the largest determinant of performance. With such constant evolution as a wind tunnel brings, almost linear changes in performance might be expected. Unfortunately, changes in performance – and specifically relative performance to other teams – are anything but linear. A team might perform well one weekend only to fall behind the next, and the reason for this is nearly always to do with management of tyre temperatures and their subsequent impact on performance.

With these caveats in mind, what does the simulation and analysis reveal? Considering first the top three teams, we see that Red Bull started with a reasonable performance advantage over Mercedes, and generally held this advantage until mid-season, when Mercedes started to gain competitiveness – finishing the year pretty well even with its main rival. Ferrari, after flattering to deceive ►

ASSESSING REAL PERFORMANCE IS COMPLICATED

The 2021 season will certainly be remembered for years to come, and one hopes the lasting memories will be of the competitive fights throughout the field rather than some of the more controversial aspects.

It is perhaps inevitable that a close battle will lead to more occasions when driving standards and even regulatory procedures become the focus of attention and, when the battle is close at the front, it is inescapable that polarised opinions will be formed. But let's put that aside for a moment and examine how the teams performed over the course of the year, in terms of the absolute performance of their cars.

It might seem simple to determine the performance of the cars each weekend, but it is in fact remarkably difficult. Looking at qualifying times does not give a complete answer. Even in the top 10 it is extremely unlikely that even one driver from each team will actually get a perfect lap, so should one take the best sector times and add them even if they were not set on the same lap? How do



The relative performance of Haas compared with its rivals varied from race to race, mainly due to tyre management issues

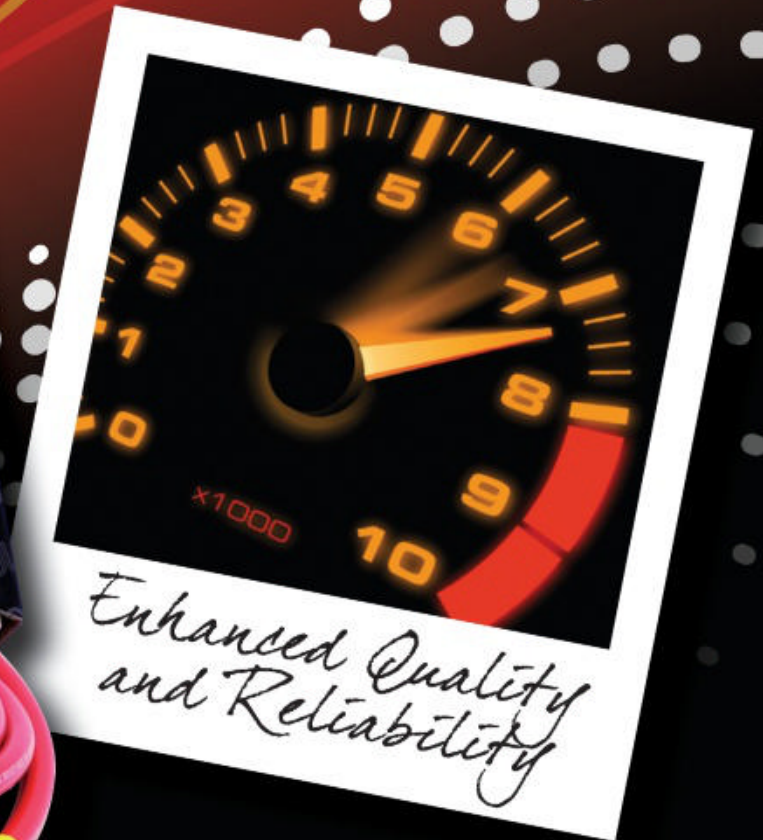
you equate the performance of the cars eliminated in Q2 from those in Q3 when a track is evolving? Also, it is often the case that the faster cars will use a less performant tyre in Q2, to allow a better race strategy, which really skews the assessment of overall performance.

Some cars will also go better than others on certain types of track, which can distort the underlying development progress. For example, we could see early in the season (see *GP Racing*, June) that Ferrari appeared to have good performance in slow corners and sure enough was most competitive in Monaco – in absolute vehicle terms, if not operational ones...

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Red Bull started the season with an advantage over Mercedes, until Mercedes clawed back performance from mid-season onwards

in Monaco, generally drifted further and further from the top two.

In midfield we saw very similar development rates between McLaren and Alpine, albeit with Alpine generally behind on actual lap time. These development rates matched that of Ferrari, but all fell short of AlphaTauri – which effectively maintained a constant deficit to Mercedes and Red Bull, suggesting the Red Bull junior team was matching the development rate at the front.

Further back there was little to choose between the development rates of Aston Martin, Alfa Romeo and Williams. Haas, although firmly anchored to the back of the grid, was rather erratic in absolute terms. This is likely due to that team struggling more to handle tyre temperatures while running two rookie drivers. What is particularly noticeable with the teams contesting seventh to 10th in the championship is that they fell further behind

WHAT IS PARTICULARLY NOTICEABLE WITH THE TEAMS CONTESTING SEVENTH TO 10TH IN THE CHAMPIONSHIP IS THAT THEY FELL FURTHER BEHIND FROM SEPTEMBER'S DUTCH GRAND PRIX ONWARDS

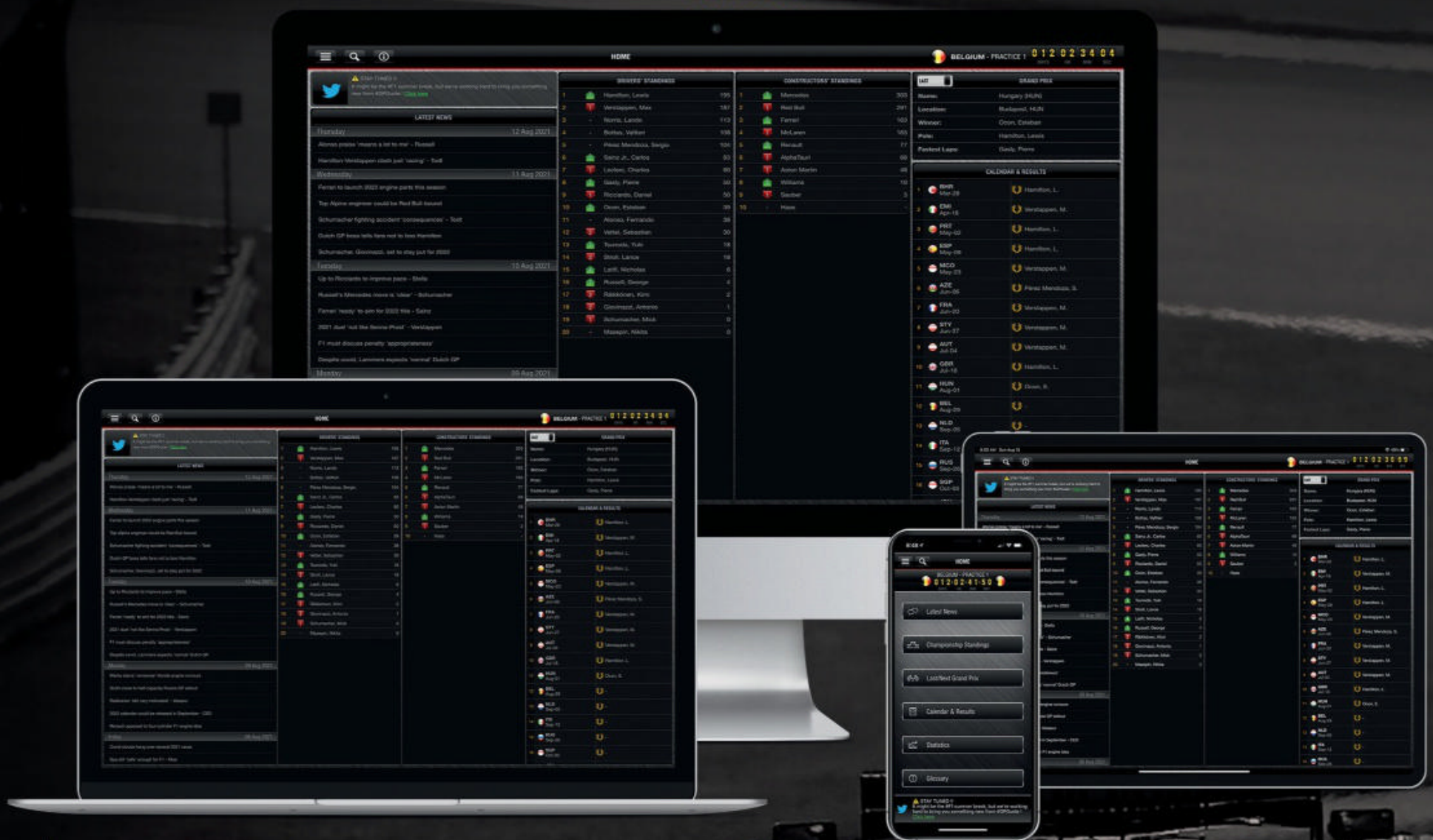
from September's Dutch Grand Prix onwards. This is very likely to be because of focus turning firmly to all-new 2022 car designs, leaving scant resource spare to continue developing 2021 models.

The constructor status enjoyed by the teams in Formula 1 is now unique in professional single-seater racing, and it is this that does so much to

drive costs. This explains, in part, the difference between running an F2 team for around £4m a year to running an F1 team with engineering and racing costs of over £100m. But it is this status that does much to ensure there is always interest and intrigue at a technical level, and adds a dimension that other formulae are now unable to emulate.

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STRAIGHT TALK

MARK GALLAGHER

[@_markgallagher](#)

those who perished were betrayed by a host of planners, contractors and suppliers. They built a 24-story chimney shrouded in flammable material for people to live in...

While we discussed the parallels between the lessons of Grenfell and Formula 1's own safety story, little did we realise these two worlds would soon collide.

When Mercedes announced its deal with Irish group Kingspan – a 'global leader in high-performance and building envelope solutions' – on December 1, 2021, the soon-to-be eight-time world constructors' champion team couldn't have anticipated the storm which would soon envelope it. While Kingspan's CEO Gene Murtagh smiled for the camera, the controversy surrounding his company's involvement in Grenfell landed on Toto Wolff's desk.

Kingspan's K15 insulation material might have made up only 5% of the insulation layer on Grenfell's facade, apparently fitted without its knowledge, but the ongoing inquiry into the tragedy heard that company employees knew the product was unsafe, hid the results of fire safety tests and behaved deceitfully in order to drive sales.

While the company condemned 'historical conduct' and apologised for the actions of a 'small group of employees', we can only wonder how its executives came to the conclusion that now was the time to launch a high-profile deal with F1's most dominant team. Particularly one which features Lewis Hamilton: F1's first black driver, a Black Lives Matter campaigner, and the championship's pre-eminent figure.

As Leslie Thomas QC, representing the bereaved families, pointed out to the inquiry, "A majority of the Grenfell residents who died were people of colour. Grenfell is inextricably linked with race."

Media headlines quickly juxtaposed the conflicting image of Kingspan branding on Hamilton's car. When Grenfell United, representing bereaved families, penned an open letter to Toto Wolff urging him to rethink the deal, it was obvious Mercedes had only one route to follow. Toto said he would sort it, and he did. The deal was cancelled within a week of being announced.

The original press release link on Mercedes' Twitter account now takes you to a holding page which advises 'Please make a U-turn'. Fortunately, the team followed that same advice once it witnessed the hostile reaction to the Kingspan deal, making it one of the shortest agreements in F1's history.

The Kingspan saga will serve as a salutary lesson for companies eager to embrace F1 without fully understanding its scale, as well as for teams too eager to sign new partners.

OUTCRY OVER KINGSPAN DEAL A LESSON FOR F1

Gill Kernick well remembers chatting to Yasin El-Wahabi. They would sometimes share the lift together, chatting about her work and his ambition to one day start a business. He borrowed her bike pump. A sociable young man with a bright future.

Yasin died together with his 16-year-old sister Nur, eight-year-old brother Mehdi and their parents in the Grenfell fire disaster of June 2017 – just five of the 72 residents to die in the UK's worst residential fire since World War II.

In September I shared the stage with Gill at a safety conference in Denmark. She spoke to the audience about Grenfell while I described F1's safety journey since Imola 1994.

Gill lived in Grenfell Tower between 2011 and 2014, later moving to the nearby Trellick Tower. She is a renowned safety consultant working in 'high hazard' industries, specifically to develop their culture and leadership to prevent accidents and catastrophic events.

To listen to her presentation of the horror which unfolded in West London is to have little doubt that



Kingspan insulation material was present in Grenfell Tower at the time of the horrific fire in 2017, and any sponsorship deal in F1 was bound to create an adverse reaction





Mercedes, like many teams, ran a mule car at the test to evaluate the new 18-inch wheels and tyres, and it also trialled wheel rim covers

PICTURE: MARK SUTTON

THE DAWN OF A NEW F1 ERA

More than just a run out for young drivers, the 2021 Abu Dhabi post-season test was a small glimpse into 2022 and a new start for Formula 1

WORDS LUKE SMITH
PICTURES  motorsport IMAGES
ILLUSTRATIONS GIORGIO PIOLA

As Max Verstappen partied until the sun came up following his dramatic world title win in Abu Dhabi, he was celebrating what he called his “final achievement”. Verstappen always made clear that winning the world championship would not change his life: even in the immediate aftermath of his win, he repeated his feeling that since he had now accomplished what he had set out to do, any success beyond this would be a bonus. But a little under 48 hours after he finally made it to bed, Max was back in the cockpit and in full title defence mode.

Post-season testing in Abu Dhabi might lack the glamour of the race weekend, or the full-on intrigue of pre-season running in Spain or Bahrain but, in 2021, the two-day session was packed with portents of the far-reaching changes to come. Unlike the 2020 one-day ‘rookie’ test in Abu Dhabi, notable largely for the incongruous presence of Fernando Alonso, December’s running had a proper structure and greater meaning. It was the final opportunity for teams to gather data before the start of winter testing in February, when the much-anticipated new generation of cars will appear.

There were two elements to the testing at Yas Marina: 2022 tyre running with ‘mule cars’ driven by members of the current grid; and rookie driver running in the 2021 cars on 2021 tyres, giving young drivers a rare on-track chance in current machinery. Naturally the teams weren’t allowed to test their 2022 cars, which will have been in the final stages of development. But they did get the chance to sample the 2022 Pirelli tyres, which are likely to be a key performance differentiator.

In line with the majority of other racing championships and trends within the wider automotive industry, the tyres are switching from 13-inch to 18-inch rims. It’s a change which will have far-reaching impacts on car performance because their grip, wear and heating characteristics will be different. The bigger wheels ask different questions of chassis dynamics, and there will be aerodynamic consequences too. Formula 2 went to 18-inch rims ahead of the 2020 season and F1 was supposed to follow in 2021 but, along with the changes to the technical regulations, this was deferred as a result of the COVID-19 pandemic.

All the testing of the new tyres so far has been completed using the so-called mule cars, modified versions of recent F1 cars which are meant to provide a closer representation of what the new cars will be like. Since the next generation of cars will generate much of their downforce differently, the mule cars offer a limited picture, but there’s still plenty to learn for both the teams and F1’s tyre supplier.

“The change is big, so any data, any elements they can collect is useful,” Mario Isola, the head of F1 and car racing at Pirelli, tells *GP Racing* over an espresso in the paddock amid the din of forklift trucks helping clear grand prix cargo. “They are not completely representative. For example, they are still using the brakes that are on the current cars. But this year [2022] cars ▶

“IT IS PRETTY LIMITED WHAT WE CAN LEARN. WE CAN’T LEARN ANYTHING ABOUT THE 2022 CAR AT ALL, AND WE’RE LEARNING AS MUCH AS WE CAN ABOUT THE TYRES” **ALAN PERMANE, ALPINE**



George Russell’s two days of testing, his first runs as a full time Mercedes driver, left him bruised as the cockpit of the W10 mule was too small for him

will be heavier, so they can add the ballast in order to achieve that weight and the weight distribution.

“They are getting data they can apply to the new car to understand how to balance it. The fact that they can collect the data in December with mule cars means that in January, they can work around this data, try to understand the tyres better, and make a better plan for the next version of the car.”

Nine of the 10 F1 teams worked with Pirelli through 2021 by creating mules, which could be a modified version of any car from 2018-2021. McLaren and Aston Martin were the only teams to use their current cars for the mule baseline, while Alpine went back to its 2018 car – the Renault RS18 – believing there was little to gain by attempting to replicate

the requirements for the 2022 car too closely. “I don’t think we’ve tried to play with aero loads at all,” says Alan Permane, Alpine’s sporting director. “We’re taking any direct comparisons with a pinch of salt.”

The only team not to build a mule car was Williams, having taken the decision during its cash-strapped days before its acquisition by Dorilton in the summer of 2020. “We chose to spend our resources on other things,” says Dave Robson, the team’s head of vehicle performance. That should have precluded Williams from taking part in the Abu Dhabi test, but the rest of the field agreed to relax the rules so it could field a 2021 car for a young driver.

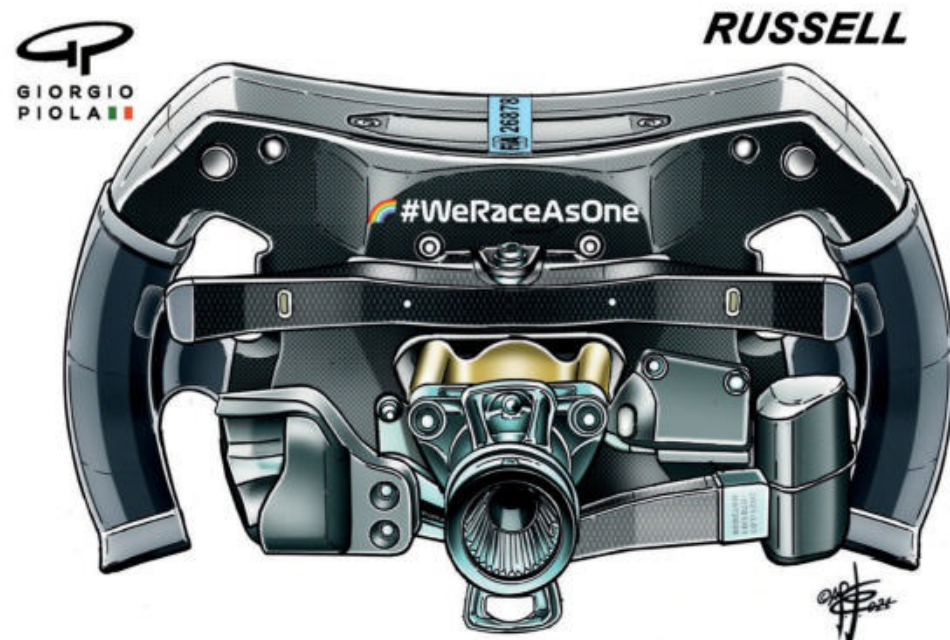
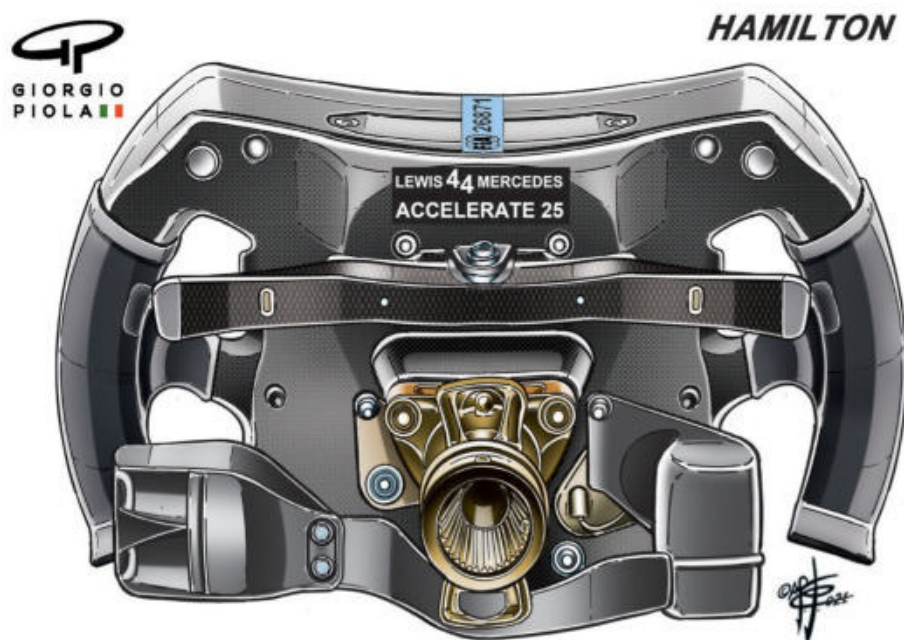
Missing the opportunity to run a mule car isn’t something

Robson feels overly concerned about. He remains emphatic that the differences between the mules and the definitive 2022 car designs are too great for the data to be properly comparable. There are some parallels with the situation ahead of the 2017 season, the beginning of the ‘wide body’ era, when Pirelli used mules to evaluate its next-generation tyres across a handful of tests. The feeling then was that while the mules simulated weight accurately, they fell short in replicating downforce levels.

“They’re allowed to make modifications to try and mimic the downforce level they think they’ll have,” says Robson. “That relies on people a) predicting what they think they’re going to have successfully;

For Pirelli this Abu Dhabi test was the culmination of two years of work fine-tuning the 2022 tyres





Mercedes had a new steering wheel ready for George Russell at the test (above right), based on Lewis Hamilton's wheel (above) but incorporating feedback from Russell after he raced for the team using Hamilton's wheel in the 2020 Sakhir GP

and b) choosing to let the rest of the field know what they're going to have. It's not clear to me that it's in many teams' interests to do that."

Permane sees it a similar way. "It is pretty limited what we can learn," he says. "We can't learn anything about the 2022 car at all, and we're learning as much as we can about the tyres, and how they react to things like camber changes, pressure changes, the drivers warming them up, the steps between the compounds, and things like that."

The test marked the final chance for Pirelli to work with the teams on its 2022 tyres, having spent the past two years fine-tuning the product. The main goal of the new tyres is to ensure drivers can push more and not become bogged down in managing their pace constantly, a recurrent gripe with the 13-inch rubber.

The brief provided to Pirelli for the new generation of tyres was to resolve this issue, ensuring the tyres could be pushed more, and offer a mix of one- and two-stop strategies for races. "We decided to develop a completely new family of compounds, with a wider working range and less overheating," says Isola. "Drivers don't want to manage tyres, they want to push." There is also a focus on improving the warm-up of the tyres, tying in with a fall in temperatures permitted for the tyre blankets ahead of a drive towards their removal by 2024.

Isola is confident the absolute

performance of the 18-inch tyres will be in line with the 13-inch models. Pirelli has worked with the teams to gather simulations of where they expect their performance to be at both the start and the end of this season. Initial beliefs the new cars may be around five seconds per lap slower than the outgoing models have been quickly dispelled as teams find ways to claw back performance – Isola reckons they could be as little as 0.5 seconds off current lap times.

With such a large technical change looming, some drivers were uncertain of how crucial understanding the tyres would be amid the bigger picture. Charles Leclerc said the 18-inch tyres are only "a very small change compared to everything else on the car", while Esteban Ocon cast doubt on the value of



Fears that the new wheels will contribute to much slower lap times are thought to be wide of the mark

“THESE 18-INCH PIRELLIS SEEM TO BE REACTING PRETTY POSITIVELY. THEY DO REACT DIFFERENTLY TO THE 13-INCH TYRES THAT WE’VE RACED ON PREVIOUSLY” **GEORGE RUSSELL**

McLaren ran an interesting LED wheel cover on Lando Norris’s car for just a single lap



PICTURES: GIORGIO PIOLA; MARK SUTTON; ZAK MAUGER; JERRY ANDRE

the Abu Dhabi running, believing it was “not going to be the most useful test”.

But every aspect of car performance has an impact. A huge rate of development is expected over the next two seasons as teams learn which solutions work and which don’t. Every team has identified 2022 as an opportunity to reset the on-track order. Nailing the tyres – understanding what has to be done to optimise their performance and lifespan – will be important even if, right now, the drivers don’t necessarily see the value.

“When you are having a big change, the team that is quicker in understanding the tyres has a performance advantage – that is clear,” says Isola. “Even with the product that is the same for everybody, the teams are working hard, and they put their engineering and resources to understand the tyres, because it is an advantage.”

The test also offered a chance for teams to trial some future F1 technology. Despite efforts to keep it hush-hush, *GP Racing*’s eagle eyes spied McLaren running an LED wheel cover on the rear of Lando Norris’s car for a one-lap run early on the Wednesday morning. The wheel cover could be used as an additional marketing tool, or to display information such as track position or lap number via the LED lights. “There are many possibilities,” says Isola. “You have the technology, so it’s easy to program what you want to display.”

While Verstappen was on-track for the test, his 2021 championship rival Lewis Hamilton wasn’t present for

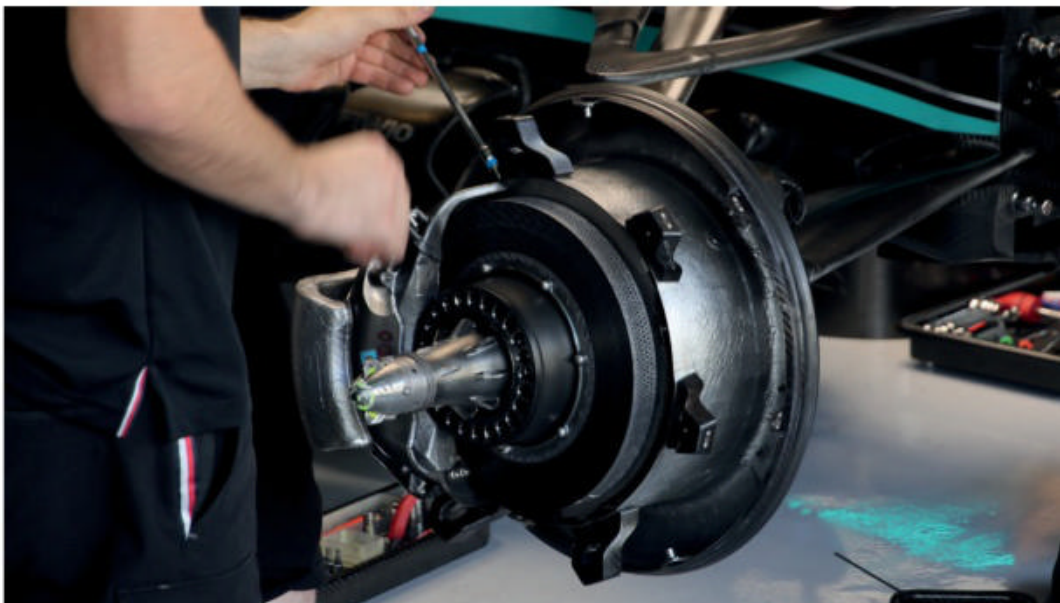
either day of running – something planned well before the controversial title decider (he was receiving his Knighthood). It meant that George Russell was able to get two days under his belt with Mercedes ahead of starting his full-time gig this season. Russell was left “battered and bruised” driving a modified Mercedes W10 – the cockpit is slightly too small for his size 11 feet, as Russell discovered when he deputised for Hamilton (size 9) in Sakhir in 2020. While it was a “strange feeling” for him to be testing as a fully fledged Mercedes driver, he sees the benefits of the tyre running.

“These 18-inch Pirellis seem to be reacting pretty positively,” Russell says. “They do react differently to the 13-inch tyres that we’ve raced on previously. Let’s hope that carries through and see how they react with the new regulations.”

Russell wasn’t the only driver settling in with his new team. The man he has displaced, Valtteri Bottas, was given permission by Mercedes to test for Alfa Romeo in Abu Dhabi despite not having officially joined the team yet. Bottas donned an all-white race suit and a Christmas-themed helmet for the test, and made sure to slow down by the Mercedes garage after completing his first outlap before giving his old crew a wave from the cockpit, which was reciprocated cheerily.

Bottas’s 2022 team-mate, Guanyu Zhou, was the only driver in the test to go out in both the mule car and the 2021 car, a privilege afforded by his rookie status. Teams could only run the 2021 rookie car on one of the two days, meaning Zhou

Sebastian Vettel's new reindeer helmet probably won't be seen during the 2022 season...



Mercedes' repurposed W10 brake drum assembly, adapted to fit the new larger wheels. Brake cooling will be a big focus for the teams in 2022

was in the C41 for Tuesday before moving to the C39 mule car on the Wednesday. Zhou completed 269 laps over two days, giving him the chance to adjust to Alfa Romeo's systems and processes, as well as meeting his new team-mates.

For the remaining teams, the rookie running was a chance to give potential members of F1's next generation a rare shot in a current car. Any private testing before 2022 had to be in cars at least two years old; pre-season testing, or practice sessions during race weekends, have been the only other opportunities for rookies to run in current cars, and that time is so valuable teams don't give it up without significant financial motivation.

F2 champion Oscar Piastri conducted Alpine's rookie running, serving as a taster of plans for his reserve role this year when he'll be testing extensively while hoping for a ▶

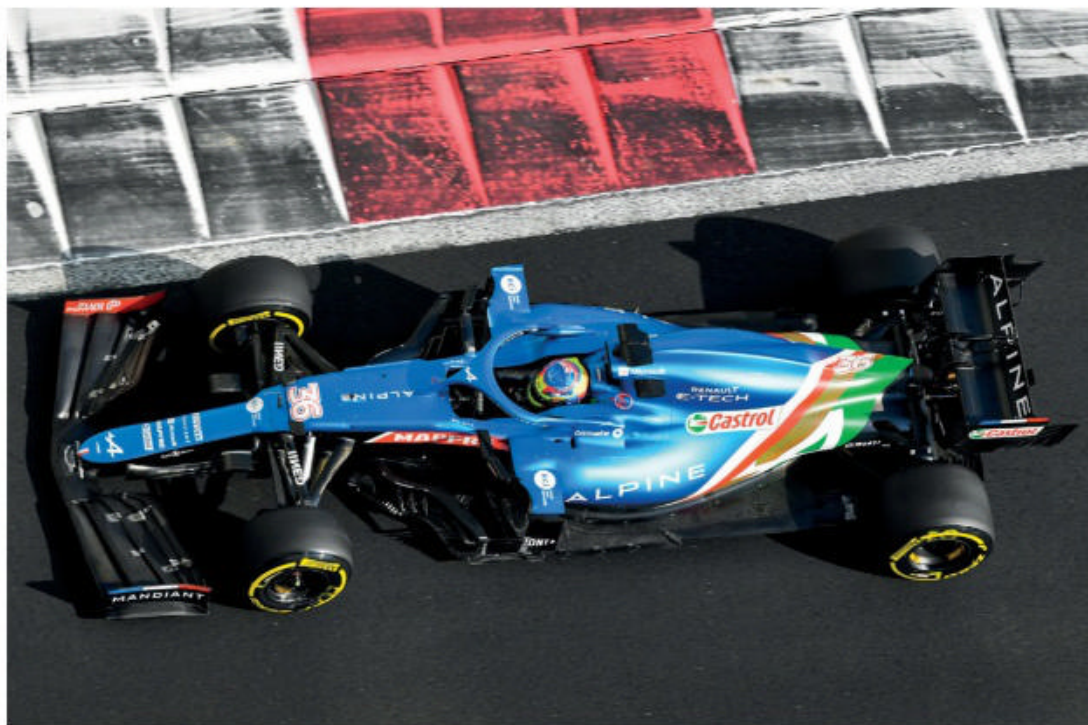


Using Kimi Räikkönen's racing boots (above), Alfa new boy Guanyu Zhou (left) got in some much-needed laps



Valtteri Bottas, the other new man at Alfa after his switch from Mercedes, had 127 laps in the mule car

“IT TOPS THE BEST DAY OF MY RACING CAREER. IT WAS EVERYTHING I EXPECTED PLUS MORE. THE STOPPING POWER IS LIKE NOTHING I’VE FELT BEFORE” **LOGAN SARGEANT**



Oscar Piastri (above), the 2021 F2 champion, spent the first day of the test in Alpine’s A521 (above right)

promotion to a race seat in 2023. The Abu Dhabi test was not only Piastri’s first opportunity to sample the A521 car from 2021, but also to drive one alongside other F1 cars on track. “It’s extremely valuable,” he says. “In my position, I know I’m doing more testing [in 2022], and I’ve done some testing previously. But a lot of the other F2 boys who were here today, it was their first time in an F1 car, and possibly their only test ever. For all of us young drivers, it’s a really good opportunity.”

While some, such as Formula E champion Nyck de Vries, who drove for Mercedes, and Aston Martin simulator driver Nick Yelloly were no strangers to the test, others were continuing to build on their formative experiences in F1 cars, including F2 race winners Robert Shwartzman and Juri Vips. But for Liam Lawson and Logan Sargeant, Abu Dhabi represented a maiden F1 outing. In Sargeant’s case, it was the latest development in a whirlwind two months in which he has gone from almost giving up the F1 dream (and turning his focus to IndyCar) to joining the Williams academy and landing a prime F2 seat with Carlin.

Liam Lawson’s maiden Formula 1 outing came courtesy of AlphaTauri in the 2021 car, the AT02

“It tops the best day of my racing career,” Sargeant says



Williams was the only team that didn’t run a mule car, but Logan Sargeant had his first taste of F1 in the FW43B

PICTURES: MARK SUTTON



of the F1 test. “It was everything I expected plus more. The stopping power is like nothing I’ve felt before.”

But it wasn’t just F2 drivers getting their first taste of F1. Inspired by Daniel Ricciardo’s bet with McLaren head honcho Zak Brown, which won Ricciardo a ride in an ex-Dale Earnhardt NASCAR, it was agreed in the early months of 2021 that IndyCar driver Patricio ‘Pato’ O’Ward – who races for the Arrow McLaren SP team Stateside – would get an F1 test if he won a race. O’Ward secured it in May with a win in Texas, paving the way for his appearance in Abu Dhabi.

Enthusiasm pours out of 22-year-old O’Ward, whose chat with *GP Racing* the day after his test is interjected with his own sound effects of downshifts, engine revs and, at one time, an excellent, deep-voice impression of Brown. ▶



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“THERE’S MAXIMUM TWO MORE YEARS FOR ME TO BE ABLE TO COME INTO THE F1 SCENE. I WILL DO EVERYTHING I CAN TO MAKE IT HAPPEN, BECAUSE IT IS THE TOP OF THE TOP” **PATO O’WARD**




Pato O'Ward (right) ran in McLaren's MCL35M (above), a reward for claiming his first IndyCar race win

He is still buzzing from his test day, which he sums up as being “insane”. He jokes that it felt like his head was going to fall off at one stage as he dealt with the g-forces, but makes one thing very clear: he wants more. Much more.

“There’s maximum two more years for me to be able to come into the F1 scene,” O’Ward says. “I will do everything I can to make it happen, because it is the top of the top. I’m going to push to my absolute maximum to make sure I leave nothing on the table, because you’ve got to take it. You’ve got to try, because if I don’t, I will regret it for the rest of my life.” It’s a bold statement for a driver who is enjoying decent success in IndyCar to set his sights so firmly on making an F1 switch.

It speaks not only to F1’s undisputed place as the pinnacle of motorsport, but also how crucial the Abu Dhabi test running is. Without these opportunities for youngsters, it would be hard for teams to find decent seat time for them, and may leave drivers such as O’Ward simply wondering what an F1 car is like, or having to source substantial wads of cash to make a private test happen.

While it was a far cry from the glitz of the season finale which took place the previous weekend, the Abu Dhabi test helped give us some signs of F1’s future through tyres, technology and drivers. We need to wait a little longer to find out what the 2022 cars look like and the order in which they will stack up, but we’ve had plenty of insight to keep us going as the days tick by to launch season... 



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Formula 1's craziest title fight in years was long in the making.

Andrew Benson has the inside story

THE GOOD, THE BAD, THE UNBELIEVABLE

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No one knew it at the time, but the pattern of the 2021 Formula 1 world championship battle was set way back in the pandemic spring and summer of 2020.

As the world shut down, teams and rule-makers worked in something close to panic to keep the sport afloat. Among the raft of changes decided upon was to use the same cars for two seasons, with only limited changes allowed.

To keep a lid on speeds, because of concerns about tyre integrity, parts of the aerodynamic surfaces at the back of the car were cut away. These changes – initially apparently small and relatively inconsequential – were the biggest single factor behind a season of Mercedes domination in 2020 turning into one of the most intense and closely fought campaigns in history the year after.

From the moment the cars hit the track in pre-season testing, the effect was immediate and

obvious. The Red Bull looked fast and planted in Max Verstappen’s hands, while the Mercedes was nervy and skittish, Lewis Hamilton and team-mate Valtteri Bottas suffering a number of spins as they struggled to get a time out of their revised car.

And when Verstappen put the Red Bull on pole for the season-opening race in Bahrain by nearly 0.4 seconds, the impression that Mercedes had a fight on its hands was confirmed.

That first race set the tone for the season. The Mercedes was much closer to the Red Bull on race pace than in qualifying. Hamilton got the jump on Verstappen with an early stop, and the race distilled to a gripping climax, with Verstappen closing on Hamilton on better

tyres. They went wheel to wheel. This time, Hamilton came off best, and Mercedes grabbed an unlikely first win.

The opening four races gave a somewhat inaccurate impression of reality, for Hamilton won three of them. Verstappen’s only victory was in the wet-dry race at Imola, where Hamilton was lucky to get away with going off and losing a lap mid-race. He was saved by a red flag caused by the crash between his team-mate and the Williams of George Russell, and he recovered to finish second.

Those results were down to a number of factors – a couple of minor qualifying errors by Verstappen, and circuit characteristics favouring Mercedes slightly in Portimão and Barcelona, where Hamilton put in two of his best drives of the season.

But from Monaco on, the true picture of performance emerged. Red Bull went on a run of five consecutive victories. Verstappen, who



would have won all five were it not for a tyre failure in Azerbaijan, established a commanding championship lead, and from then on it was all about catch-up for Hamilton and Mercedes.

It looked all but over for Hamilton, until a big upgrade package introduced at Silverstone made the Mercedes inherently a faster car than the Red Bull. But it gave up its secrets reluctantly and for quite a while the team struggled to maximise it.

There was a strategy error at the restart in Hungary, leaving Hamilton the only car on the grid for one of the most bizarre opening sequences in F1 history, and consigning him to a fightback from last after one lap. Then there was the race that wasn't a race in Belgium, and Verstappen took Hamilton out in Monza.

After languishing in seventh for most of the race in Russia, Verstappen was saved by the late downpour and vaulted to second. An engine penalty hamstrung Hamilton in Turkey.

In Austin, against expectations, the Red Bull

was a slightly quicker car. In Mexico, as expected, Verstappen won decisively, helped on his way by Bottas leaving a gap the size of a barn door on his outside on the run to the first corner, after tyre-temperature struggles in qualifying had relegated Verstappen to third on the grid.

All of that left Hamilton realistically needing to win the final four races of the season to take the title. He very nearly did it. With a change in set-up approach for Brazil, Mercedes could finally access all the car's performance and Hamilton went on a roll, only to be undone on the very last lap of the final race after the race director made up the rules as he went along.

It was 22 races over nine months that was at various turns breathless, thrilling, bad-tempered, toxic, gripping and, of course, controversial. At the heart of it were two of the finest drivers who ever walked the earth. They raised themselves head and shoulders – and more – above the rest of the field.

THE TECHNICAL BACKDROP

How did a season in which Hamilton won 11 of the 17 races and Verstappen only two turn into one of the closest in history while using the same cars? The answer lies in the detail of those changes dreamed up in the summer of 2020. A triangular section – known as the 'cheese slice' – was cut out of the floor in front of the rear tyres, and some of the aerodynamic appendages at the back were removed.

Mercedes suspects the changes were deliberately planned to peg it back; the FIA and F1 say it was nothing of the sort. Whether by subterfuge or serendipity, they disproportionately affected the cars designed to run with low rake compared with those running high rake. Mercedes and Red Bull are the originators of those contrasting design approaches.

Mercedes runs low rake – a flatter angle from front to rear – using a long wheelbase with a ▶



1. In Bahrain testing Mercedes struggled with the nervy W12, but the RB16B was quick from the word go

2. Verstappen was on pole for the season-opener in Bahrain but Hamilton took a surprising victory

3. The surprises continued. Hamilton's win in Spain meant he'd triumphed in three of the first four races

4. Max responded with a dominant win in Monaco, to wrest the championship lead away from Lewis



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1. Hamilton won the British GP, but Mercedes' upgrade package introduced at the race took longer to be fully effective

2. Hamilton was left scratching his head after a Mercedes strategy error in Hungary left him as the only car to start the race from the grid

3. The rule removing the 'cheese slice' area on the floor caused the low-rake Mercedes problems in the early part of the season



large floor area to generate downforce. Red Bull draws its cars with a high rake – a steeper angle from front to rear – and the greater height of the diffuser is the key aerodynamic factor.

Why did the changes affect Mercedes more than Red Bull? The answer lies in something called tyre squirt – disturbed airflow generated by the rear tyres – which spills into the diffuser area. Tyre squirt creates slow, turbulent air in an area where teams want clean, fast airflow to generate the low pressure that sucks the rear of the car towards the ground. So teams work hard to get it out of the way.

On a high-rake car, this is done by the fences in the diffuser and the high volume of air working together to create out-wash, which sweeps the tyre squirt out of the diffuser.

But a low-rake car does not have the same air mass in the diffuser. It attacks tyre squirt

at source. The floor edge, close to the ground, generates vortices – mini-tornadoes – which are directed down towards the inner edge of the tyre to deal with the squirt. Removing the 'cheese slice' makes it harder to generate those vortices, so more disturbed air leaks into the diffuser space, creating a loss of downforce and greater instability.

On certain types of circuit this problem was less pronounced – hence the Mercedes' stronger performance in Portimão and Barcelona – but the problem was never fully sorted until Mercedes' Silverstone upgrade.

How much of a performance difference did this make? In 2020, Mercedes' average margin over Red Bull in qualifying was 0.77%. From 2020 to 2021, Mercedes lost 1.663% of performance on tracks that hosted races both years, Red Bull only 0.904%. So, year to year, Mercedes lost 0.759%

more pace than Red Bull. In other words, nearly all its 2020 performance advantage.

Red Bull would argue that it adapted better to the changes – Verstappen described the progress it made as a team as "very impressive".

Mercedes would counter that the nature of the changes made it harder to find the normal gains – Hamilton, echoing and enhancing team boss Toto Wolff's description of the difficulty of getting Merc's 2017 car into its set-up sweet spot, described the 2021 machine as "a monster of a diva" (for the inside line on the W12's development, see p66).

There were other factors at play, of course. Honda upped its game, bringing forward by a year an engine upgrade it had planned for 2022 after the board's decision to quit F1. Red Bull also benefited in the first half of 2021 from using a flexible rear wing which bent backwards on the

straights, reducing drag. This circumvention of the intent of the rules was ended by a stiffening of load tests from the French Grand Prix.

That, combined with Mercedes' Silverstone upgrade, meant Red Bull went from having a small advantage on the straights in the first half of the season, to a less-small deficit in the second. Meanwhile, Mercedes's attempts to recover the gap were hampered by an engine reliability issue which raised its head in the second half of the season.

THE DRIVER FACE-OFF

The effect of all this was to produce two cars very closely matched in performance, between which the advantage swung from race to race depending on a number of factors.

How close was it? Over the first half of the season, the Red Bull was the faster car in qualifying by an average margin of 0.014s;

over the second, it was the Mercedes, by 0.167s, which comes down to 0.123s if you adjust for Verstappen completing the spectacular qualifying lap which he ended in the wall at the final corner in Saudi Arabia.

Inevitably in a season so close, results swung on tiny margins. In Portimão qualifying Verstappen ran fractionally wide on a lap that would have put him on pole, and had the time disallowed. Had he started at the front, could he have held on to win? Quite possibly.

In Baku, a tyre failure – caused, Pirelli said, by the tyres being run below expected minimum pressures – cost Verstappen a win.

Hamilton was then poised to take the lead at the restart, only to inadvertently knock the 'brake

THE EFFECT OF ALL THIS WAS TO PRODUCE TWO CARS VERY CLOSELY MATCHED IN PERFORMANCE

magic' button – which turns the brake bias all the way to the front so as to increase tyre temperatures on a warm-up lap – on the run to the first corner, where he locked up and sailed into the run-off area. No points, when he could have had 25.

In France, a strategic miscalculation by Mercedes turned a Hamilton lead into a Verstappen victory.

In Belgium, on a low-downforce set-up in the wet, Hamilton was a touch over-cautious through Eau Rouge in qualifying, and he lined up third, when he could have been on pole. On a weekend when there was no race, but half points were awarded, that was another points swing.

With the two cars and drivers evenly matched, ►

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6



4. Verstappen was saved by the late downpour in Russia, when it seemed the best he could hope for was seventh

5. After wins for Max in the US, where Lewis was on pole, and Mexico the title looked to be heading only one way

6. The high-rake Red Bull seemed less prone to 'tyre squirt'. The team argued it responded better to the 2021 rule changes

the season was defined by a series of hard-fought and incredibly close on-track battles. Races were often decided on strategy, But when the two cars battled together on track – as they did at Bahrain, Imola, Barcelona, Silverstone, Monza, Austin, Interlagos, Jeddah and Yas Marina – there were inevitable fireworks.

At the starts in Imola and Spain, Hamilton backed out when Verstappen took what was to become his familiar approach – on the inside, throw the car in, leave the guy on the outside a choice whether to avoid him, often by going off track, or crash, sort it out on the exit.

Hamilton started the British Grand Prix with a 33-point deficit, and decided enough was enough. After a frantic half-lap's battling the two collided at Copse, Hamilton – alongside on entry – deciding the time for backing out was over. Verstappen ended up in hospital, via the tyre wall, unimpressed; Hamilton the winner, despite a 10-second penalty after being found

predominantly to blame for the accident.

That incident coloured the rest of the season. At Monza there were two flashpoints. Hamilton backed out on the first lap, from the outside of the Roggia chicane. But not mid-race at the Rettifilio, where they collided again, and Verstappen's car ended up on top of Hamilton's. This time Verstappen was penalised.

Then, in Brazil, many felt that Verstappen over-stepped the line.

This was Hamilton's day of days – in 2021, and perhaps in his entire career. Relegated to the back of the grid for the sprint qualifying event, Hamilton finished it fifth in just 24 laps. Dropped to 10th for the start of the grand prix, he was third behind the Red Bulls of Verstappen and Sergio Pérez within five laps.

The second part of the race, after a Safety Car, was all about Hamilton tracking Verstappen and trying to find way by. On lap 48, he thought he'd done it. He got a run on Max and was ahead

on the outside into Turn Four, the Descida do Lago. Verstappen went in deep and fast, on a trajectory and speed that would never have kept him on track. Both cars went off, but the stewards declined to investigate, to the incredulity of many other drivers.

At a meeting at the next race in Qatar, the drivers demanded a clear explanation of what was allowed in wheel-to-wheel racing. They didn't get one. At the race after that, in Jeddah, Verstappen and Hamilton were at it again. And this time Verstappen did get a penalty.

At the final race in Abu Dhabi, Max was again on the wrong side of a decision, this time adjudged to have forced Hamilton off track as he attempted to retake the lead on the first lap having lost it at the start. The race director decided Hamilton did not have to give up the lead, despite having gone through the run-off area and cut the chicane.

Verstappen felt none of this was fair,

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that his driving was hard but acceptable. Others disagreed. But all year, there were complaints about an inconsistency of decision-making from officials; the incidents between Hamilton and Verstappen were just the tip of the iceberg.

In the end, Verstappen won 10 races to Hamilton's eight, led well over twice as many laps and took 10 poles to Hamilton's five. Hamilton would argue that the victory tally should have been nine-nine had it not been for the race director's improvisation with the rules in Abu Dhabi. But Verstappen was, by any measure, a worthy and deserving champion.

IN THE END, VERSTAPPEN WON 10 RACES TO HAMILTON'S EIGHT, LED WELL OVER TWICE AS MANY LAPS AND TOOK 10 POLES TO HAMILTON'S FIVE

Every race he finished, bar Hungary, he was either first or second. As Mercedes turned the screw in the latter stages of the season, Verstappen, as Red Bull team boss Christian Horner said, kept Red Bull in it. Max's drive in Austin, in particular, was a masterpiece of maturity and control, of the sort Hamilton himself has produced many a time over the years. And then there was the qualifying lap that nearly was in Jeddah. Fernando Alonso was watching it live in the TV pen, hugely impressed, and then clearly disappointed when it ended in the wall. "Max is driving – in my opinion – one step ahead of all of us," Alonso said later.

And when Verstappen set pole by nearly 0.4s in Abu Dhabi, there was more praise: "Unbelievable. Honestly unbelievable. He's outstanding."

The consistently high level of Verstappen's performances in 2021 surpassed even Hamilton, who had a handful of lukewarm moments. Lewis got away with the error in Imola, which could have been very costly. He was weak in Monaco. He didn't view the 'brake magic' incident in Baku as a driver error *per se* – justifiably – but an error it was nevertheless.

But arguably Hamilton's highs were even higher than Verstappen's. His win in Brazil was undoubtedly the drive of the season – making up an effective 25-place grid penalty to come through the field twice to win – and will go down as one of his greatest ever, if not the very best.

When he needed to win all four races at the end of the season, he was on course to do it – despite having to pass Verstappen on track in three of them, knowing that an incident would



1. Lewis's brake issue at the restart in Baku, after Max's tyre blow-out, meant he missed out on a huge positive points swing

2. Brazil was where Hamilton seriously raised his game. He battled through from last on the sprint race grid to win

3. Verstappen's error in qualifying for Saudi Arabia, when pole was almost guaranteed, could have been a very costly mistake

4. The shenanigans during the first Saudi Arabian GP at Jeddah, set up a winner-take-all decider in the final race of the season

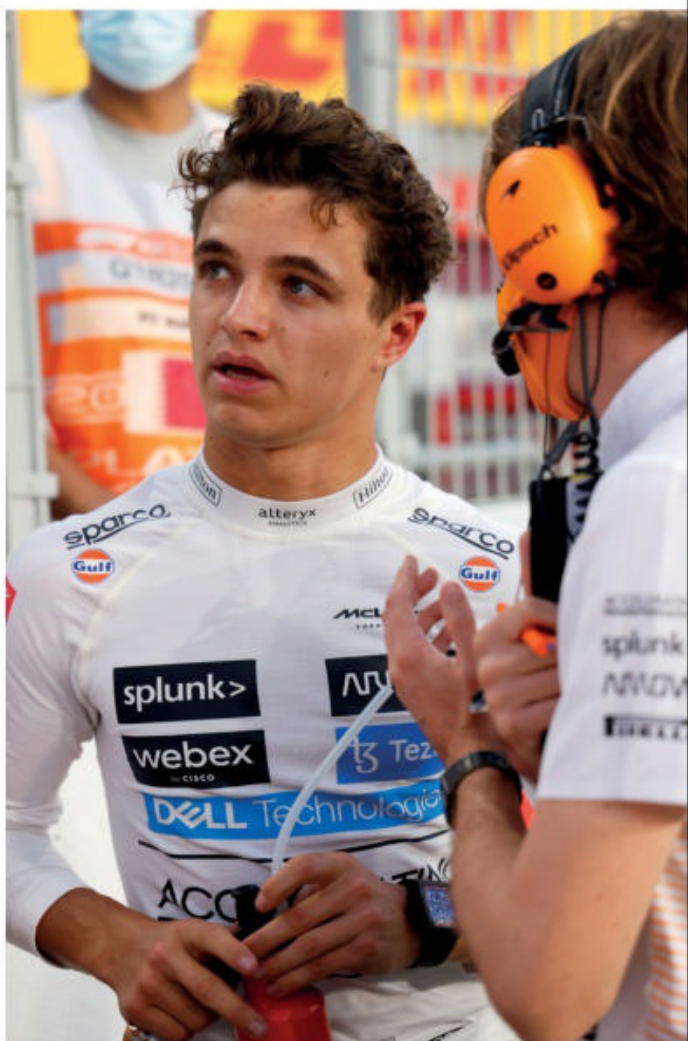
5. The first-lap incident in Abu Dhabi was controversial, but it was only the support act for what happened over the final few laps

1



1. Lando Norris was one of the other stars of 2021. He upped his game from 2020, claimed more podiums and points than his experienced new team-mate, and should have won in Russia

2. Ferrari recovered from a disastrous 2020 and new boy Carlos Sainz settled in to life at the Scuderia well. He beat established Ferrari driver Charles Leclerc, although Leclerc's Silverstone drive was an outstanding effort



2



effectively end his hopes. And the way he dealt with Verstappen's aggression in wheel-to-wheel racing was pretty much flawless, Silverstone notwithstanding. How many other drivers could have handled Verstappen with so much control?

THE OTHER STARS

In a season so dominated by two drivers, there was little room for others to stand out, but a few managed it.

Chief among them was McLaren's Lando Norris, who went into 2021 knowing he was facing a defining season. With Daniel Ricciardo joining the team, Norris had a race-winner as a benchmark, someone who at Red Bull had gone toe-to-toe with Verstappen.

"It's always that question when you go up against a driver like that," Norris said. "Are you

going to do well?"

Norris answered the question emphatically. He was McLaren's outstanding performer, and there were a series of starring drives. The best was Russia, where he put it on pole in the wet and was set for a maiden win before the team misread the weather in the closing stages and left him out too long on slicks.

Like Norris, Carlos Sainz faced a defining year, having moved to Ferrari, where he would be up against Charles Leclerc, whom Sainz described as "the best qualifier on the grid – one of the greatest, if not the greatest talent in F1 right now".

NORRIS ANSWERED THE QUESTION EMPHATICALLY. HE WAS MCLAREN'S OUTSTANDING PERFORMER, AND THERE WERE A SERIES OF STARRING DRIVES

Sainz acquitted himself impressively, moving to live close to Maranello, integrating himself deeply into the team and demonstrating a work ethic he has inherited from his famous rally driver father. He was quick from the off, and got quicker through the year, outqualifying Leclerc four times in the last five races, and finishing just ahead in the championship.

Leclerc, though, was still slightly the stronger Ferrari driver. And for all Sainz's strengths, Leclerc produced Ferrari's performances of the year, with poles in Monaco and Baku, and his ►

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remarkable drive at Silverstone, where he flat-beat Mercedes' Valtteri Bottas, and was within three laps of victory, only to be overwhelmed by Hamilton's comeback drive.

After his starring performance as a sub for a Covid-hit Hamilton in Bahrain in 2020, Russell was always expected to land the second Mercedes seat for 2022, but he removed all doubt with a brilliant season for Williams. The highlights were undoubtedly his qualifying performances in Spa and Sochi. Both were in the wet, both – almost unbelievably – put him ahead of Hamilton's Mercedes. And his second on the grid in Belgium

will surely go down in history as one of the greatest laps by anyone ever.


And then there was Alonso. It took him a few races to get fully up to speed on his return after two years out – as he had said it would – but once there, he was his old, combative, super-quick self.

Holding off Hamilton for 11 vital laps in the closing stages in Hungary secured team-mate Esteban Ocon's victory and was possibly the single most impressive piece of race-craft all season.

And Alonso's drive to third in Qatar – stunning in qualifying, an audacious move around the outside of Pierre Gasly's Alpha Tauri on

the opening lap and a race of exquisite control and management thereafter – was one of the best by anyone all year. At 40, the veteran Spaniard proved there is plenty of life in the old dog yet.

Amid all this quality it was a shame that, after arguably the greatest F1 season ever, between two such outstanding drivers, the FIA managed to find a way to end the championship in the most unsatisfactory way: decisions by the race director, taken apparently contrary to the rules, decided who won the title.

It might not have produced the wrong champion – when Verstappen and Hamilton were as good as they were in 2021, there could have been no such thing. But it certainly left F1 with some soul-searching to do before it embarks on a new era that has a lot to live up to after such a spectacular end to the last one. 

Andrew Benson is BBC Sport's chief F1 writer

RUSSELL WAS ALWAYS EXPECTED TO LAND THE SECOND MERCEDES SEAT FOR 2022, BUT HE REMOVED ALL DOUBT WITH A BRILLIANT SEASON FOR WILLIAMS

1



1. There were signs of the Fernando Alonso of old in 2021, after his two-year break from F1. His defensive drive to hold off Lewis in Hungary was crucial to ensure team-mate Esteban Ocon's win

2. George Russell's last year at Williams was his best. Qualifying masterclasses at Spa and Sochi were the highlights, which justified Mercedes' decision to replace Bottas in 2022



2



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MAX VERSTAPPEN

The 34th driver to win the world championship reflects on a tumultuous season, a remarkable rivalry with Lewis Hamilton, and the pure emotion of giving engine partner Honda a victorious send-off

What's your view of the 2021 championship?

It's been a tough season. We had some dominant races, but also in general I think Mercedes was a stronger team. It's been a really enjoyable battle, having two teams fighting and pushing flat out to the end. But of course at times you think this might not be it, we might not hang on 'til the end. But there are always surprises, and some races I think we won which we shouldn't. But then also I had quite a bit of bad luck, such as with the tyre getting taken out [a blow-out while leading the Azerbaijan Grand Prix] and these kind of things. So we also lost a lot of points like that; all in all, it's been intense but a crazy season.

During the season you said you never felt under pressure. Now it's all over, was that true?

Well, throughout the season yes, I think everything was fine because I was just looking at it race by race, and that helps a lot. But of course [the Abu Dhabi Grand Prix] was quite a nervous day for sure when you're fighting for the title.

Did the Mercedes protest after the season finale take the shine off the day?

No – it's quite typical, looking at the season, that it happens. It is what it is. We were still happy and enjoying it. You know, as a team we didn't do anything wrong. We raced when there was a green flag, we went for it and we did it on track. So for us at the time, we were just enjoying it.

Do you think the titles were split in the right way, you with the drivers' championship, Mercedes with the constructors'?

With the drivers' championship it could have gone either way. I think Lewis and me, we both



had an amazing season, pushing each other to the limit. And I think it's fair in the constructors'. They were in general the faster team, so there are no regrets. We really tried everything as a team to do well, but I think it's a fair result.

Do you have any sympathy for Lewis and the way he lost the championship?

Of course. There was one side that was incredibly happy, and one side disappointed. Of course I felt for Lewis. He did everything right, throughout the whole race, but F1 can be very unpredictable. And it can go either way. It could have been the other way around as well, where I would be controlling the race and lose it in the last lap. That, unfortunately, is also part of racing.

**I THINK LEWIS AND ME,
WE BOTH HAD AN AMAZING
SEASON, PUSHING EACH
OTHER TO THE LIMIT**

You've been driving at a very high level for a long time. Do you feel the battle with Lewis this year has pushed you both to an even higher level?

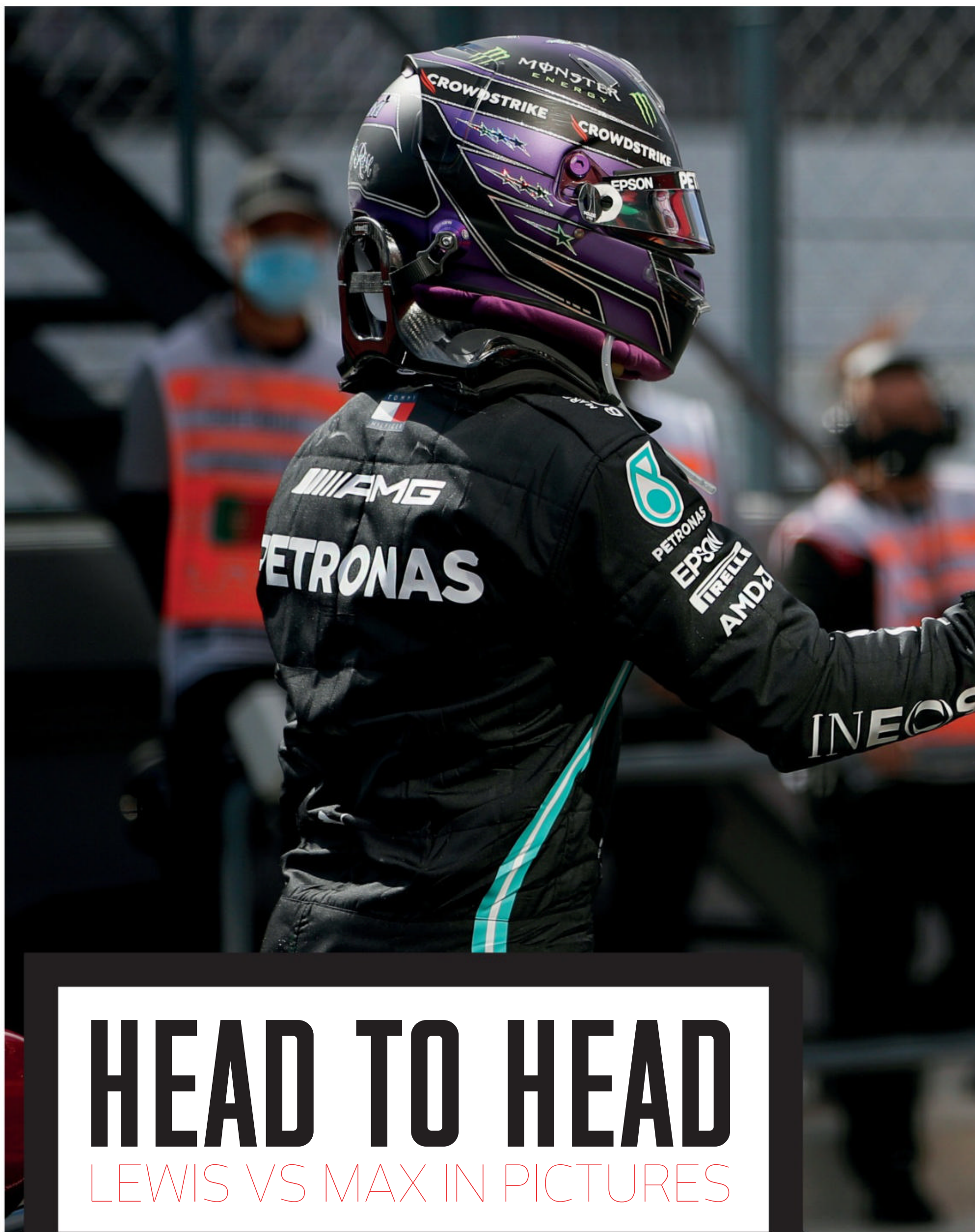
I think not necessarily like we were pushing each other, but we were pushing the whole team behind us as well to another level, which they maybe didn't think was possible. So for everyone it was very intense, and to be fighting every single race, everyone had to be so perfect with strategy, preparations before a weekend, avoiding mechanical failures, all these things. There was a lot of pressure and stress for everyone involved.

Are you going to run with the number one rather than 33 on your car next season, and what would it mean to you to have it on the car?

Yeah, I will. I will run it. How many times can you do that? I don't know, maybe it's the only time I can in my life. I think it's the best number out there. I will definitely put it on the car.

You've ended Red Bull's championship drought and given Honda something it never thought it would achieve. Back in 2017 Honda felt pretty hopeless about its programme, its personnel were in tears as you crossed the line in Abu Dhabi. What's that feeling like for you?

All the emotion came out from everyone, and it's the story of never give up, of keeping pushing. It was a very difficult situation for them back then, but everyone in the team told them we can do this together. You have to believe, and that's what they did. Of course, there was a lot of investment, but that's normal in F1, you need to do that. To win the championship altogether, in Honda's final race, being fully part of the team, it was insane, everything came out with the emotions.



HEAD TO HEAD

LEWIS VS MAX IN PICTURES



The 2021 season's explosive finale in Abu Dhabi remains hotly debated – and rightly so. But how did we get there? Our photographers caught the major flashpoints that built to a fiery championship run-in between Lewis Hamilton and Max Verstappen

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Race 2 – Emilia Romagna Grand Prix

Lewis Hamilton had overturned Red Bull's pace advantage to snatch an unlikely victory in Bahrain. At Imola a characteristically brilliant Q3 lap earned him pole position ahead of Sergio Pérez and Max Verstappen – but, given the RB16B's superiority, Lewis needed to maintain track position from the start.

But Verstappen was faster away, hooking up neatly while Hamilton didn't quite nail his starting procedure. From third on the grid, Max was side-by-side with Lewis as they entered Tamburello, and determined to own the inside line. Hamilton tried to hang on but then had to back out to avoid a collision, clattering over the kerbs.

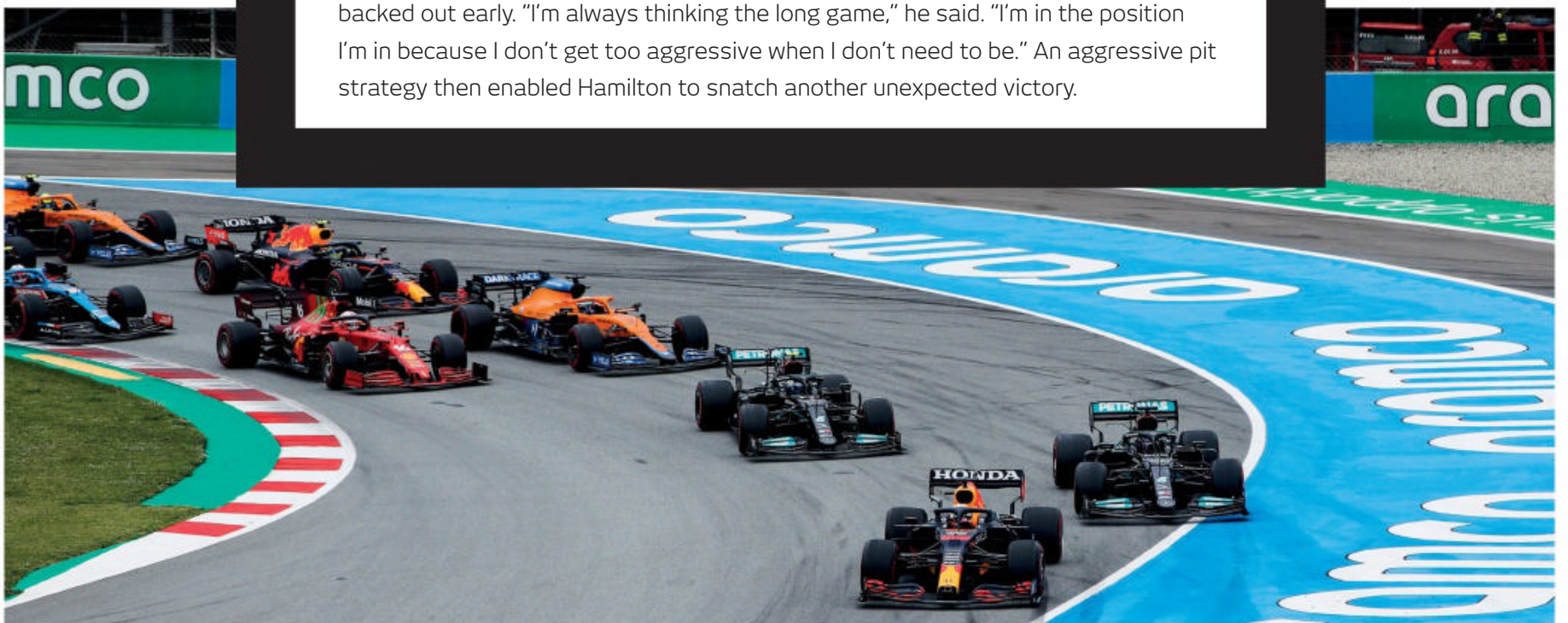




Race 4 – Spanish Grand Prix

Victory in Portugal, where the track favoured Mercedes, extended Hamilton's lead in the drivers' standings. In Spain he qualified on pole with Verstappen in second.

Mercedes hoped third-placed Valtteri Bottas might be able to spring forward and occupy the inside line into Turn 1, so Hamilton duly stuck to the left – and Verstappen lunged for the inside line. But there would be no repeat of Imola: Lewis backed out early. "I'm always thinking the long game," he said. "I'm in the position I'm in because I don't get too aggressive when I don't need to be." An aggressive pit strategy then enabled Hamilton to snatch another unexpected victory.





Race 10 – British Grand Prix

Silverstone followed a run of three consecutive Verstappen victories, and it would have been five but for Max's tyre-induced DNF in Baku. Hamilton had been unusually muted in Monaco, lost a potentially good result in Baku to a brake lock-up, been on the wrong end of a strategic error in France, and simply couldn't keep up in Austria.

Despite a car upgrade Lewis lost out to Max in the sprint qualifying event, lining up second for the grand prix, setting up a raucous and wheel-banging opening lap. Neither driver could afford to give an inch. For Hamilton, playing the long game was a thing of the past. Their controversial collision at Copse was... almost inevitable.



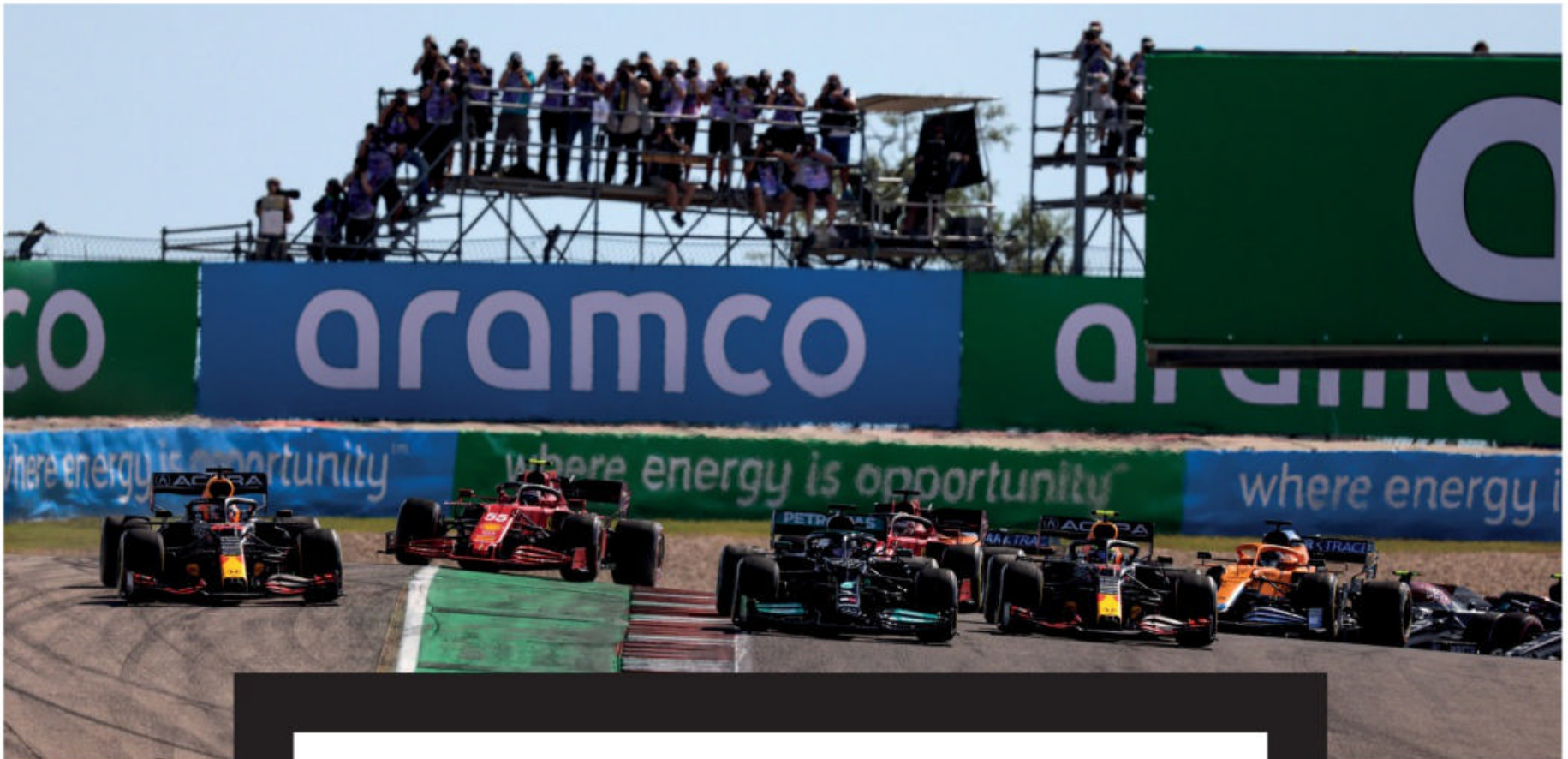


Race 14 – Italian Grand Prix

The title protagonists arrived at Monza separated by three points while rancour and paranoia reigned off-track. As Mercedes continued to unlock performance in the W12 following the Silverstone upgrade, Red Bull aired suspicions that these gains had been found via chicanery in the engine bay and aero package.

Max and Lewis were separated by three places on the grid, starting P1 and P4 after the sprint event, but were brought together on track after slow first pitstops. Hamilton was uncompromising as he claimed the first apex of the chicane. Max was in no mood to give up, taking them both out and earning a penalty for the next race.





Race 17 – US Grand Prix

The parallels with Silverstone were clear and ominous. Verstappen on pole, Hamilton alongside, off-track tensions simmering as Red Bull ramped up the rhetoric about the legality or otherwise of Lewis's car. Both drivers made good starts but Hamilton's was better, so as Max legally but forcefully swooped across to block the inside line on the uphill run to Turn 1... Lewis was already alongside.

Out of options, Verstappen took to the run-off – “the long way round” as he put it – and set his mind to fighting back. He'd do so in arguably his most mature and complete race victory yet, executing a bold tyre strategy to perfection.





Race 19 – São Paulo Grand Prix

At Interlagos Mercedes nailed the W12's elusive sweet spot, enabling Hamilton to win despite starting the sprint qualifying race from the back (owing to his rear wing's DRS slot being too wide) and incurring a further penalty for an engine change.

The flashpoint came on lap 48 as Lewis tried to sweep around the outside of Max's Red Bull for the lead at Turn 4. Both cars went wide and the Mercedes had to go off track. The decisive move by Hamilton came on lap 59, but his team was enraged when the stewards declined to investigate the first move – even more so when it emerged the stewards hadn't seen potentially incriminating in-car footage.

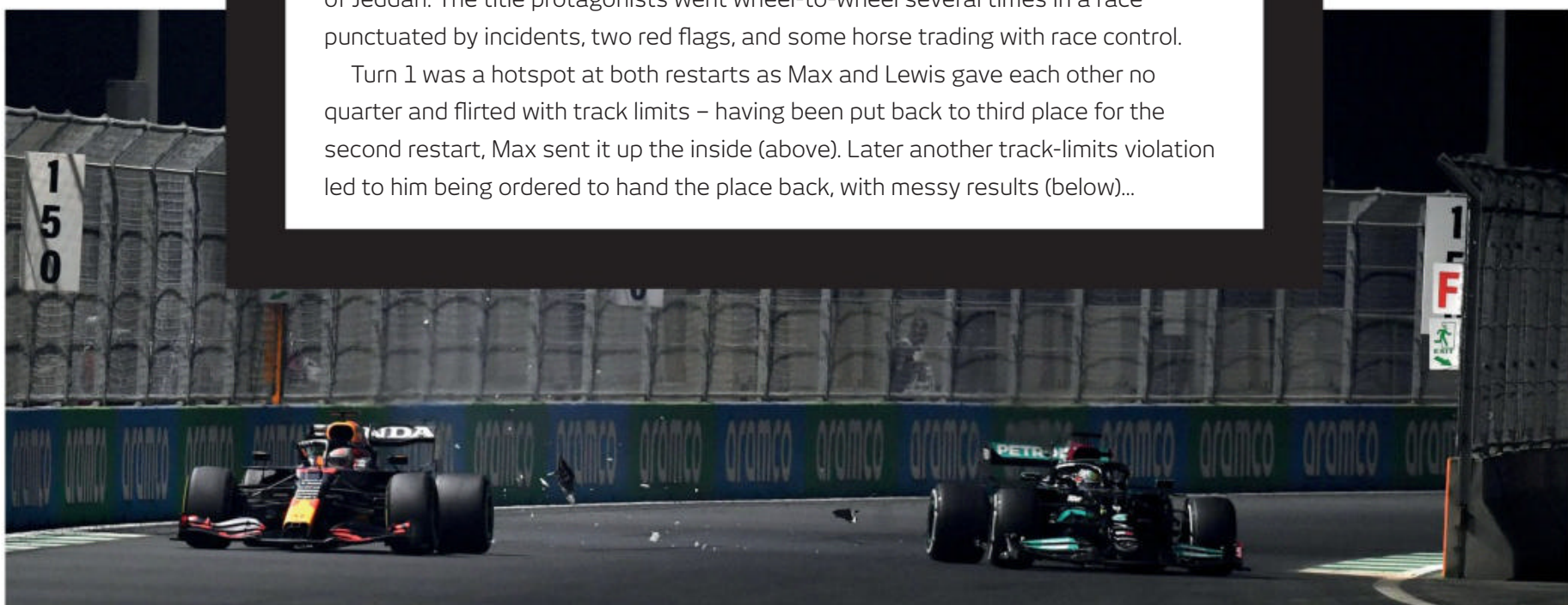




Race 21 – Saudi Arabian Grand Prix

By the penultimate round Hamilton needed to win to stay in the game and this, combined with all the off-track politics, led to a demolition derby on the streets of Jeddah. The title protagonists went wheel-to-wheel several times in a race punctuated by incidents, two red flags, and some horse trading with race control.

Turn 1 was a hotspot at both restarts as Max and Lewis gave each other no quarter and flirted with track limits – having been put back to third place for the second restart, Max sent it up the inside (above). Later another track-limits violation led to him being ordered to hand the place back, with messy results (below)...





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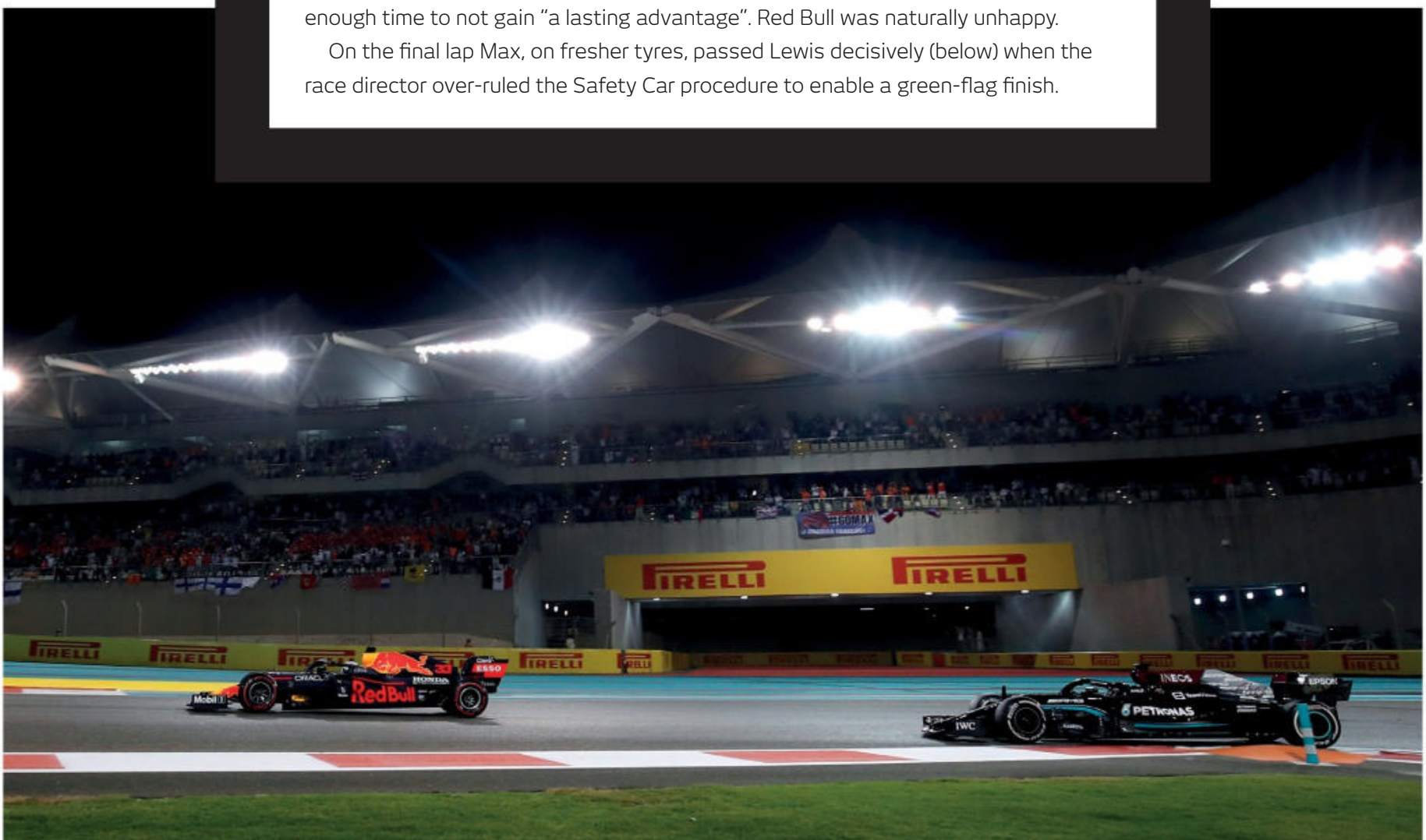
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Race 22 – Abu Dhabi Grand Prix

Heavy-handed intervention from race control laid the ground for a bad-tempered final round as the protagonists arrived equal on points. The first call was marginal: Hamilton tried to hold position from a lunging Verstappen at Turn 6 and, as at Interlagos, found himself squeezed onto the run-off (above). Lewis emerged in the lead but the race director decreed he could keep the position, having handed back enough time to not gain “a lasting advantage”. Red Bull was naturally unhappy.

On the final lap Max, on fresher tyres, passed Lewis decisively (below) when the race director over-ruled the Safety Car procedure to enable a green-flag finish.



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(BRITISH GT/GB3)



7/8 MAY

SILVERSTONE GP

(BRITISH GT/GB3)



28/29 MAY

DONINGTON PARK GP

(BRITISH GT/GB3)



25/26 JUNE

SNETTERTON 300

(BRITISH GT/GB3)



30/31 JULY

SILVERSTONE GP

(GB3)



10/11 SEPTEMBER

BRANDS HATCH GP

(BRITISH GT/GB3)



15/16 OCTOBER

DONINGTON PARK GP

(BRITISH GT/GB3)

SECRETS OF THE 'MONSTER DIVA'



After a shaky start, the W12 delivered Mercedes an eighth consecutive constructors' championship. Speaking exclusively to *GP Racing*, tech bosses **Mike Elliott** and **Hywel Thomas** explain the reasons for the team's toughest-ever title defence...

WORDS STUART COOLING PORTRAITS ADRIAN MYERS PICTURES MERCEDES AND  motorsport
IMAGES



TEAM BOSS TOTO WOLFF

famously described Mercedes' fast-but-fractionous 2017 W08 car as "a diva". Recalling that sobriquet during the 2021 world championship run-in, Lewis Hamilton went a step further when discussing the challenges of taming the W12: "This one," he said, "is a monster of a diva."

For all that Lewis dominated the 2020 season, repeating the feat, even with a carry-over car, was never going to be easy. A budget cap, new limits on in-season development, a resurgent Red Bull, a new technical ruleset on the horizon, along with new aero regulations announced relatively late in the day – all these factors would conspire to render 2021 a most perilous tightrope act.

It was a period of change behind the scenes, too, as Mercedes technical director James Allison 'moved upstairs', handing the reins to former head of aero Mike Elliott, while Hywel Thomas embarked on his first full season at the head of Mercedes AMG High Performance Powertrains, after taking over from Andy Cowell in 2020. Daimler welcomed new investment from Ineos into the team and stepped down its shareholding to a one-third stake. To the outside world at least, the 2021 season would provide a test of the serial championship-winning team's strength in depth, even if those at the coal face in Brackley and Brixworth viewed it as business as usual.

2021 would prove to be more challenging than Mercedes expected. In the early phase of the pandemic, when the introduction of the all-new technical formula was kicked down the road to 2022, F1's stakeholders also agreed to a partial freeze on development between the '20 and '21 seasons, to be governed by a system of tokens. Teams were given a deadline of 22 July 2020 to inform the FIA of how they planned to spend their tokens. Believing most gains could be found at the front end, Mercedes committed to spending its tokens on the nose of the W12 – only to have to scrap those plans later.

"When a chunk of the car is carried over, you are limited in what you can do," says Elliott. "Our feeling was that for our car – and that doesn't mean it was the same for anybody else – there might be opportunity in the nose. And actually there was opportunity. It's just that by the time we got to a final solution, the improvement wasn't big enough to justify the cost of the effort. And as a consequence of that, we decided not to do it."

Mercedes had switched off development of its 2020 car early with a view to focusing on the 2022 package, but 2021 returned to the agenda as the FIA looked to peg back downforce levels to

protect Pirelli's tyres. The timing of the changes added complications: an initial package of cuts to the floor and other aero devices was announced in May 2020 but then superseded by another in October, later in the W12's development.

While the changes might have seemed relatively minor – a tapering of the floor in front of the rear wheels and removal of slots and strakes in this area, combined with stricter size limits on strakes in the diffuser and the inner face of the rear brake assembly – they added up to a substantial change in car behaviour. And it appeared to be the case that Mercedes and the similar Aston Martin 'low rake' designs were disproportionately affected by the new regulations.

"For us, it was a massive hit," says Elliott. "And the initial development slope recovering that was very steep. The biggest hit was in the mid ride heights [at the rear] where we run the car. Very quickly we were recovering performance there. It wasn't until we got further into development, we started finding it was easier to make gains at the higher ride heights. And that was starting to raise some alarms, in the months coming up to Christmas [2020], that maybe this set of rules would be worse for us than for cars running higher rear ride heights."

"If you take for instance the trim to the 'cake tin' deflectors [on the rear brakes], where the bottom of the cake tin deflector interacts with the top of the floor – if your floor is physically much higher, that trim is completely different in the way it works."

While this discovery would push Mercedes towards running the W12 with a higher rear ride height, converting fully to the 'high rake' philosophy pioneered by Red Bull was impossible, even if it were desirable. The rake angle is fundamental to the aero concept of the car and would require nose-to-tail change, mechanically as well as aerodynamically.

So even if Mercedes felt inclined to take the massive competitive risk involved in adopting high rake – a philosophy many rivals took years to understand and optimise – it couldn't under the newly agreed budget cap and development restrictions. Besides far-reaching aero changes, high rake would also demand a new gearbox design and rear suspension, items falling within

Mercedes' W12 was developed within the limitations of the token system and budget cap cost restrictions





the realm of the token system. Notionally Mercedes had long since committed to spending its tokens on the nose...

Given the imminent need to focus significant resource on the 2022 project, Merc's technical team naturally prioritised understanding the impact of the 2021 changes and finding ways to restore aerodynamic performance. Seemingly minor cuts to the strakes within the diffuser had greatly reduced the loads it could generate. The diagonal trim to the floor ahead of the rear

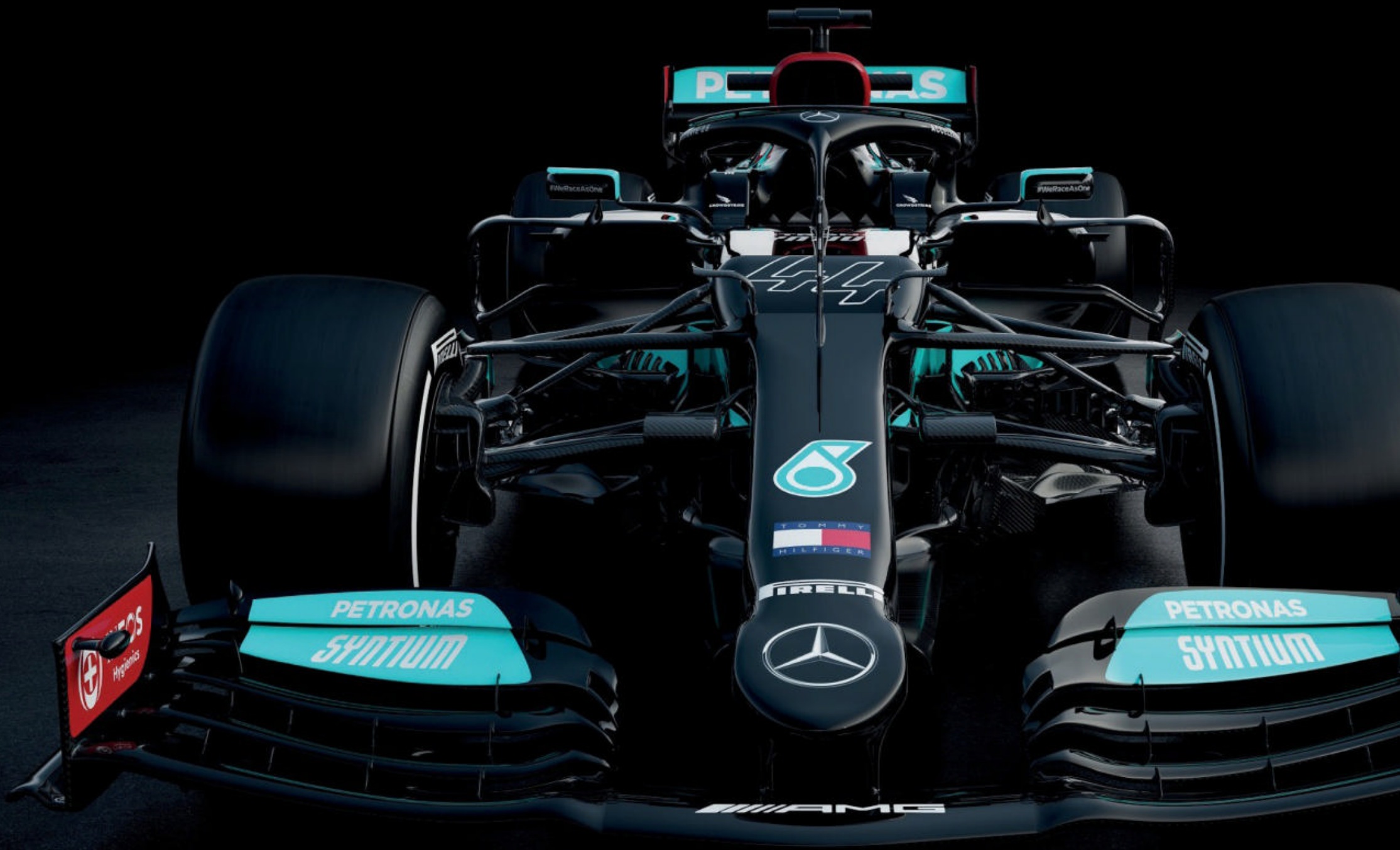
2021 was Hywel Thomas' first full season at the head of Mercedes AMG High Performance Powertrains

tyres also had a significant impact on the airflow coming into the diffuser area from the side of the car; this effect was compounded by the cuts to the deflectors at the lower edges of the rear brake housing. All the aerodynamic surfaces in this area are designed to work harmoniously to maximise airflow to the diffuser, while balancing pressure across the diffuser's edge and reducing turbulence caused by the floor edges and the tyres.

"The level of aerodynamics now on an F1 car, it's not the case that you change one bit ►

“IF I GO BACK TO THE PREVIOUS SEASON [2020], THAT WAS A HUGE CHANGE ON PERFORMANCE. AND WE NEEDED TO TIDY OURSELVES UP A LITTLE BIT – THERE WERE A FEW SHABBY THINGS THAT WE’D LEFT OVER THROUGH CHASING PERFORMANCE, AND WE NEEDED TO READJUST EVER SO SLIGHTLY TO MAKE SURE WE HAD THE RELIABILITY”

HYWEL THOMAS



and you find performance,” says Elliott. “What we’re trying to do is to manage the flow features, and how the various surfaces all interact to control those flow features. So if you’ve optimised a car to a certain position, and you change something, you can’t just put that something back. You genuinely have to change everything around it to rebalance and get back to a new optimum.

“With a big regulation change, you see the change in flow structure, and then what you’re trying to do is to get that underlying flow structure back, or ask if there’s a new flow structure which will be better. As an aerodynamicist, you’re thinking from that flow structure point of view, and then you develop the parts to try and get you there.

“You build understanding by experimenting in CFD and the windtunnel: for engineers, F1 is an understanding race. If you understand what’s going on better than your competitors, you end up with a better engineering solution. So there’s always a time gap from the point regulations change to the point where you understand how big the effect will be.”

During this process the aerodynamicists also had to evaluate the potential impact of a new air intake system proposed by Mercedes’ powertrain division in Brixworth. The new design featured a larger plenum, the reservoir which equalises the pressure of air ingested through the airbox. Theoretical advantages of higher plenum volumes include greater power and the ability to run engines with leaner fuel mixtures, improving efficiency – but trade-offs include greater bulk and the potential for diminished throttle response.

“If you looked at the original plenums, the proof-of-concept work we did before committing to this, and saw the size of those plenums – everyone at Brackley was saying, ‘Well, that’s definitely going nowhere near the car!’” says Hywel Thomas. “It took a number of iterations to get the physical shapes and the specifications we needed into a package where we could even consider having a sensible conversation with the guys from Brackley.

“It’s all about what makes the fastest car: it’s us coming forward and saying, ‘Look, we’ve got something which is this size, we realise it doesn’t fit inside the existing engine cover, but this is the sort of performance we can get. What’s your position on that?’ They’ll estimate how much performance that might cost, so we’ll go away



Without the pandemic 2021 could have been a less-challenging year for Thomas (above) and Elliott (below)



and do more work to put a more concrete number [on the potential gains]. And then as that starts to get more real, Brackley might do a windtunnel run to establish what exactly is the downside.

“All these things get looked at in the round, and you ask if this is going to make a quicker car or whether it’s just an ego trip from the engine guys. The decision is driven by data rather than emotion.

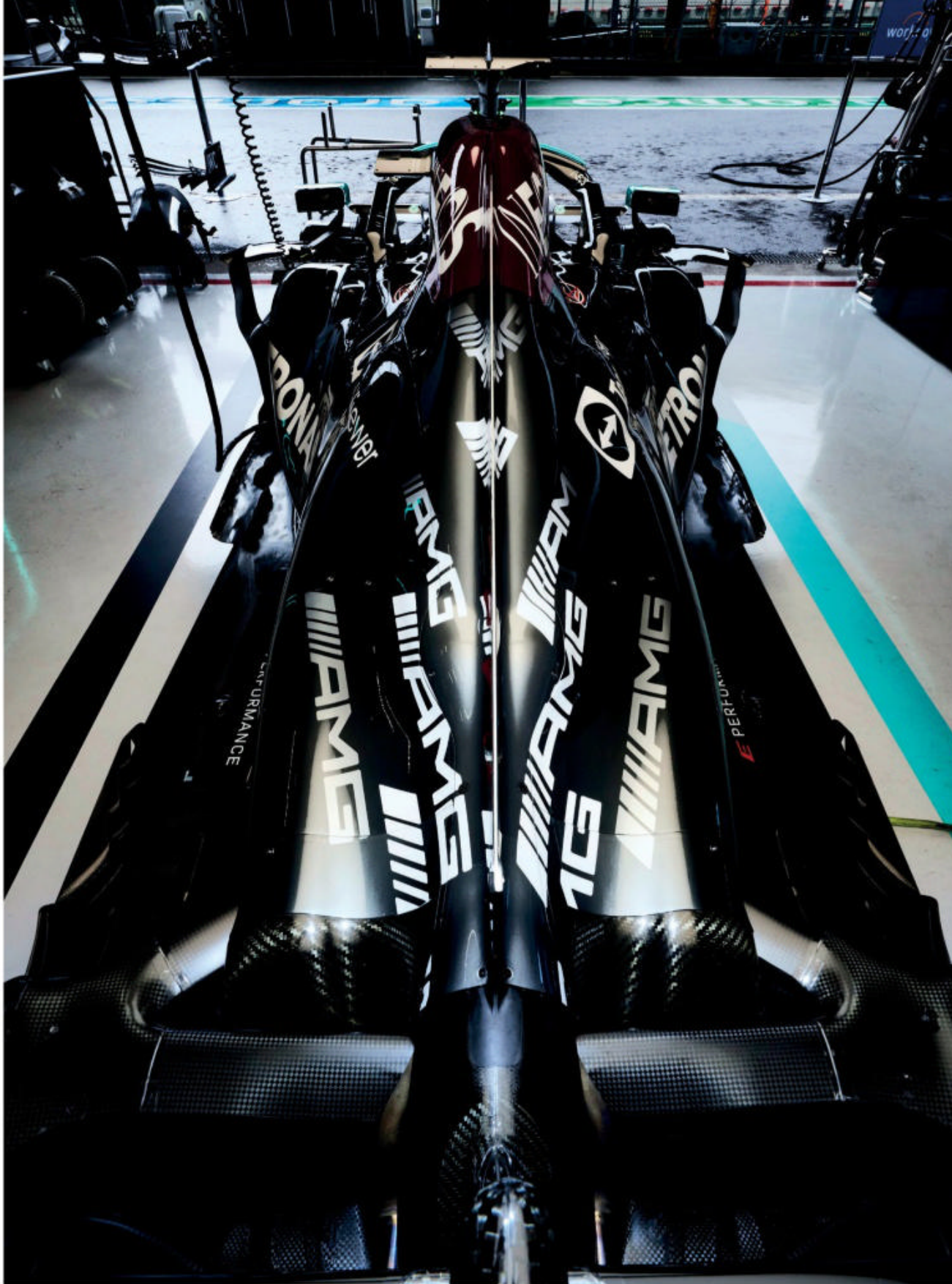
If the data comes back and says the aero loss is twice the size of the gain from the engine, then it’s a bad idea.”

When the W12 hit the track in pre-season testing a further consequence of the aerodynamic changes manifested itself: the car’s peak performance was much harder to access. It wasn’t a question of pure downforce, more an issue of the W12’s responses during the different phases of a corner – characteristics now so different from previous Mercs of the hybrid era that it rendered much of the team’s bank of set-up knowledge irrelevant. It would also take time to reproduce accurately in the simulator, reducing the value of this critical element of the team’s toolbox.

During the course of a test punctuated by spins and slides for both Mercedes drivers, the picture was complicated further by the performance of the new power unit. Both Hamilton and Valtteri Bottas – along with several drivers in Mercedes’ customer teams – raised queries about the new engine’s driveability. While it wasn’t a ground-up conceptual redesign, its new intake system required far-reaching changes to accommodate.

“There were some sizeable changes from 2020,” explains Thomas. “In terms of quantity, there were more changes for reliability. If I go back to the previous season [2020], that was a huge change on performance. And we needed to tidy ourselves up a little bit – there were a few shabby things that we’d left over through chasing performance, and we needed to readjust ever so slightly to make sure we had the reliability.

“The previous season was actually quite short because of the pandemic – 17 races, whereas this season it was 22. So although it was the same sort of challenge in terms of number of engines [three for the season], because there were so



many more races it was actually quite a step. And there were quite a few things that needed tidying up for that.

“On the performance side, the biggest change we did was the introduction of the new plenums and changing the design in that engine breathing area. The number of parts that touched and required adjustment to make that fit, and make it work, was large.

“We learned a significant amount quickly. Part of the thing with those new plenums was it did mean a big rework on some of our calibrations. There was a little bit of talk [at the test] that we weren’t as good as we had been previously. But what having eight drivers’ feedback was very good at was pinpointing which areas were a real issue to them, to make sure we could attack those first and get the solutions quickly.”

Despite the prevailing impression that Mercedes was in trouble, Hamilton won the

Mercedes produced a final upgrade package for the W12 in July, but attention then turned to 2022

season opener in Bahrain – albeit slightly against the run of form versus Red Bull, and assisted by Max Verstappen transgressing track limits at a critical moment. Mercedes fitted an upgraded floor to the W12, featuring a new diffuser design, in time for the second round at Imola. But the sweet spot of the car remained frustratingly difficult to access despite intensive work on the simulator; Bottas said he “lost count” of how many setup items he evaluated in the sim ahead of the Emilia-Romagna Grand Prix, where he struggled and crashed out while Hamilton secured pole but was then fortunate to salvage second after a scrappy race.

While Red Bull’s RB16B appeared to be the quicker car, or at least the easier of the two to optimise, Mercedes and Hamilton contrived to extract both performance and results from the W12, with the exception of the races at Monaco and Baku – although the cost of Lewis’s blunder in the latter was offset by Verstappen’s retirement. But Red Bull was bringing new components to every race, while Mercedes wasn’t. After a run of three Verstappen wins in France and the twin Austrian races, it seemed as if the championship was slipping away.

Max was particularly dominant at the Red Bull Ring, after which a dispirited Hamilton called upon Mercedes to “find some performance” and said the car “needs an upgrade of some sort” to get him back in the fight. But by then – early July – Mercedes had already signed off the W12’s final upgrade package and shelved onward development in favour of the 2022 car. F1’s new aero development restrictions, where leading teams are permitted less wind tunnel time and fewer CFD resources than those further back, were a key influence on the decision.

“In years gone by we might have been doing 400 runs a week,” says Elliott. “It dropped to 81, then 65, and we’re now on 30-odd a week. You’ve got to make very clear and calculated decisions about what effort you put into which car.

“If you look at the potential development gradient of the new rules, which is huge, versus those in a set which is reaching its end, you have to put your effort into the new car. Gains start to become harder to find. You’re faced with a choice between doing a week in the tunnel on next year’s car, which might be worth a tenth of a second, or doing work on the current car which might be worth a couple of hundredths.

“Lewis is an intelligent driver – when you show him the data and explain why you’re making the decisions you make, he buys in.”

Mercedes engineers continued to work on setting up and understanding the W12, as well ►

“GAINS START TO BECOME HARDER TO FIND. YOU’RE FACED WITH A CHOICE BETWEEN DOING A WEEK IN THE TUNNEL ON NEXT YEAR’S CAR, WHICH MIGHT BE WORTH A TENTH OF A SECOND, OR DOING WORK ON THE CURRENT CAR WHICH MIGHT BE WORTH A COUPLE OF HUNDREDTHS” MIKE ELLIOTT

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“YOU DON’T DWELL ON THE FACT THAT IT’S NOT GREAT. YOU TRY TO FIND WHAT’S GOOD AND TRY AND FIGURE OUT HOW YOU CAN MAKE THE PARTS THAT AREN’T SO GOOD BETTER” LEWIS HAMILTON

as fine-tuning the driveability of the power unit. The final update package, fitted at Silverstone in mid-July, comprised a detailed evolution of the bargeboards and their straked deflectors, along with a new profile at the leading edge of the floor, and new front and rear cake tins. It delivered bigger gains than expected.

Mercedes has always been strong at Silverstone in the hybrid era so Hamilton’s victory there was unsurprising, if controversial owing to his clash with Verstappen. Subsequent rounds confirmed the impression that Mercedes had found something. Its new-found strength in a straight line set Red Bull reaching for explanations, levelling claims of illegality at the power unit (suggesting the new plenum featured a super-cooling device), the rear suspension and the rear wing. FIA investigations found no charges to answer.

“That was an interesting moment to start talking about that [super-cooling],” says Thomas. “I’m not sure what they were thinking, to be honest.”

“In terms of the rear suspension, it didn’t change, we didn’t spend any tokens on it, it’s clearly the same as it’s been in previous years,” says Elliott. “If you look at the Red Bull it is set up soft, at a higher rear ride height, and they use their travel up through the phases, the different speeds of the corners. We run a lower ride height with a stiffer car and, therefore, we’ve got more suspension travel to play with between our cornering phase and our straight line. All that happens is the suspension stiffness varies with load – that’s completely within the regulations and it’s something all the

Thomas admits the engine reliability issues the team faced last season came as a bit of surprise




teams do to a greater or lesser extent.”

Hamilton cites the São Paulo GP as one of the few events of the year where the W12 was unequivocally in its sweet spot. It was also where he began a three-race winning streak which enabled him to stay in contention for the drivers’ title until the final round – despite being put to the back of the grid for the sprint race at Interlagos when his rear wing failed scrutineering, and taking a five-place grid penalty for the main event for fitting a new power unit.

Worries about the powertrain defined the championship run-in for Mercedes, requiring it to add new elements to the pool strategically. Hamilton took his fourth new engine of the year in Turkey, a full month before the Interlagos round, while Bottas was already on his fifth as the final flurry of flyaways beckoned, taking his sixth at October’s US GP.

“We did have some reliability problems and they came out of the sun,” says Thomas. “We got a little bit caught out, which was very uncomfortable. But once we realised we had a problem, it’s all about the decisions you make.”

A tricky car isn’t necessarily a slow one, and the W12, while not as finely poised as its predecessor, certainly wasn’t slow. Was it decisively faster than the RB16B? Probably not, and its treasure chest was far harder to locate and unlock. But the team – and its star driver – got there, even if it required a major update package and a fundamental rethink on set-up.

As Hamilton himself said: “You don’t dwell on the fact that it’s not great. You try to find what’s good and try and figure out how you can make the parts that aren’t so good better.” 

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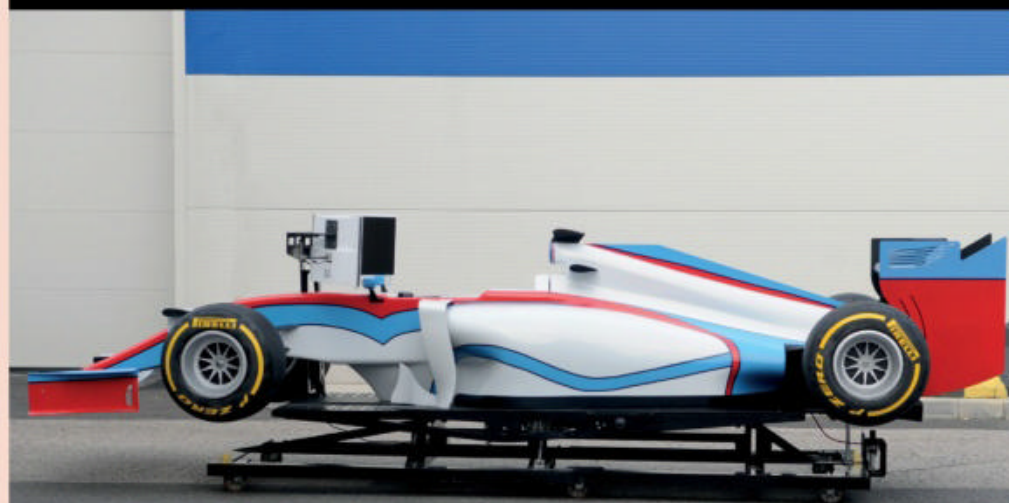


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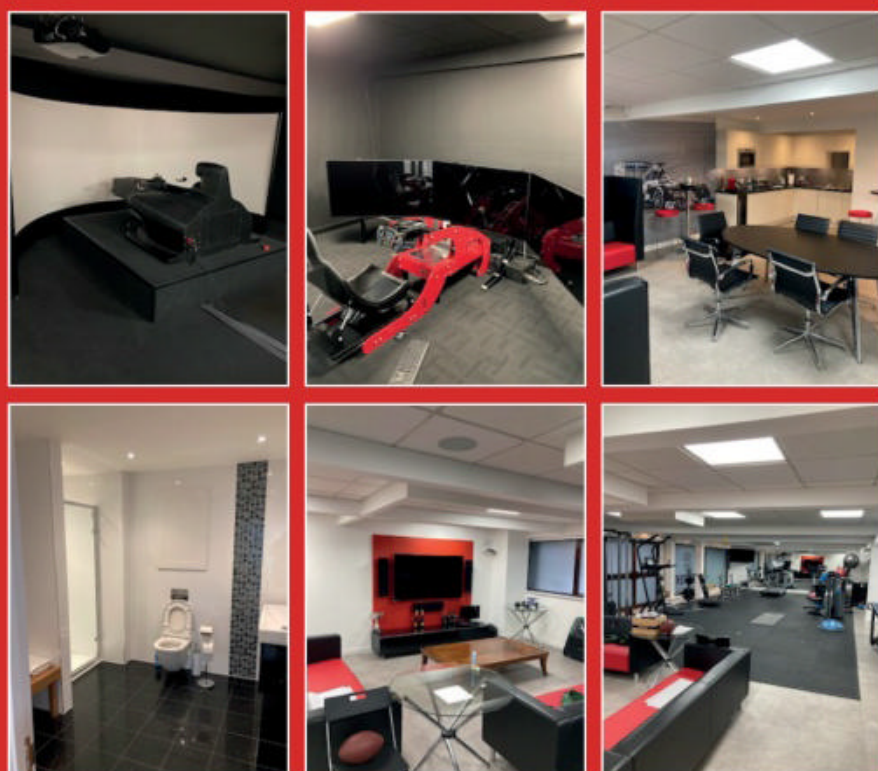
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PICTURES OF THE YEAR

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BATTLING THROUGH THE HAZE

Daniel Ricciardo's first year at McLaren was a mixed bag. There were early-season struggles such as Austria (pictured), where he qualified 13th and teammate Lando Norris second. But then in Italy it all came into focus for a deserved victory at Monza





1

1 THINKING TIME

Sebastian Vettel contemplates his new life in the midfield, ahead of practice for the Azerbaijan GP. The four-time champion's career at Aston Martin started slowly, but two days later he celebrated a first podium for his new team



2

2 RAIN STOPS PLAY, AGAIN

When third practice for the Russian GP at Sochi was cancelled, due to rain, thunder and lightning, minds went back to Spa a month earlier. Was a repeat on the cards? Thankfully, it wasn't, and the rain cleared for qualifying to start on time

3 RED MIST

Lewis Hamilton's Mercedes stands out in gloomy conditions that pervaded the Turkish GP from start to finish. Lewis had started 11th after a grid penalty but was annoyed with Mercedes for making him stop late from third for new tyres...

4 THE CROWD IS BEHIND YOU

On the final lap of the Mexico City GP the stadium section spectators urge on home favourite Sergio Pérez in his chase of Lewis Hamilton for second. Pérez fell 1.197s short but still became the first Mexican to secure a podium in his home race





2



4



1

1 STARS ALIGNING

George Russell scored his first points in a Williams in 2021, and claimed his first F1 podium, but confirmation that he would switch to Mercedes in 2022 was the news he had been waiting for...

2 HELMET OF HEROES

Valtteri Bottas claimed the 19th pole position of his Formula 1 career at the Mexico City GP, where he was also awarded this replica of the helmet Juan Manuel Fangio used in 1951



2

3 IT'S ALL A BLUR

Lando Norris's 2021 was outstanding. He came agonisingly close to a maiden win, claimed four podiums and his first F1 pole position, and out-scored his experienced team-mate Daniel Ricciardo

4 SPRAY IT AGAIN MAX

After a slightly unexpected and restrained performance on the podium, new world champion Max Verstappen takes aim at his Red Bull colleagues in the Abu Dhabi pitlane and lets rip with the bubbly





1

1 YOU CAN'T PARK THERE

Monza, and the almost inevitable consequence of two drivers unwilling to give an inch to each other. Max Verstappen walks away from his beached Red Bull, which is sat atop Lewis Hamilton's Mercedes

2 FLAT OUT AT FERRARI

To say that Carlos Sainz made a great start to life at Ferrari is a bit of an understatement. He finished two places above team-mate Charles Leclerc in the drivers' championship and managed four podiums



2



3

3 BEFORE THE STORM

Mercedes and Red Bull bosses Toto Wolff and Christian Horner shook hands before their star drivers went into battle in the winner-takes-all Abu Dhabi GP. Only one was smiling two hours later

4 ALL BY MYSELF

Sergio Pérez trudges back to the pits after the Saudi Arabian GP was stopped for the second time. Pérez's Red Bull was tagged by Charles Leclerc's Ferrari and was too damaged to continue

5 IT'S BEGINNING TO SINK IN

Max Verstappen takes a moment after winning the Abu Dhabi GP, and with it his first ever world championship, to try and process the fact that he has finally realised his childhood dream

5



4



PICTURES OF THE YEAR





2

3



1 HOLD ME TIGHT, DON'T LET ME GO

Lewis Hamilton has a tight grasp on the British GP trophy, having just won the race for the eighth time. More importantly, it was Hamilton's first win since Spain, to trail Max Verstappen by only eight points

2 CLOSE ENCOUNTER

Max Verstappen leads Lewis Hamilton as they look to resume racing after an early-race Safety Car in Mexico. Lewis had lost out to Max at the start and this was as close as he got to the Red Bull thereafter

3 WHY DID IT HAVE TO BE ME?

Eyes closed, a despondent Max Verstappen has just lost an almost guaranteed victory in the Azerbaijan GP, due to a tyre failure. His mood improved when Lewis Hamilton made a hash of the restart...

4

ON THE NIGHT SHIFT

As the 2021 season reached a climax, everyone in F1 had to start pulling a few night shifts. Qatar, Saudi Arabia and Abu Dhabi all featured practice sessions and races under artificial light



PICTURES OF THE YEAR

1 THREE-INTO-ONE

At the second restart of the chaotic inaugural Saudi Arabian GP, Max Verstappen caught title rival Lewis Hamilton – who was trying to ward off Esteban Ocon on his outside – napping at Turn 1 to take the lead

2 SIGN OF THE TIMES

Just in case Max Verstappen hadn't realised he'd just claimed his first world title after the Abu Dhabi GP, he could turn around to see it writ large for the whole world. And he'd signed it, so it must be true...

3 BRAZILIAN MASTERCLASS

Lewis Hamilton waves a Brazilian flag after a stunning recovery drive at the São Paulo GP. Twentieth on the grid for the sprint, he climbed to fifth, then started the GP 10th after a penalty before scything his way to an improbable win

4 OUT OF THE SHADOW

Esteban Ocon had a double world champion as his Alpine team-mate in 2021 but Ocon refused to sit in Fernando Alonso's shadow. A breakthrough win in Hungary and a fourth in Saudi Arabia were his highlights...



1

2





3



4

PICTURES OF THE YEAR

1 FORMULA 1'S DRIVE OF SHAME

Max Verstappen blasts past the bedraggled crowd at Spa with the Safety Car out of shot up ahead. Verstappen claimed a half-points victory but F1, not for the last time in 2021, didn't cover itself in glory

2 COOL HAND SEB

Sebastian Vettel's days of being in the red-hot title battle might be over, for now, but the German still needed additional cooling from dry ice as he waited to go out during qualifying in Saudi Arabia



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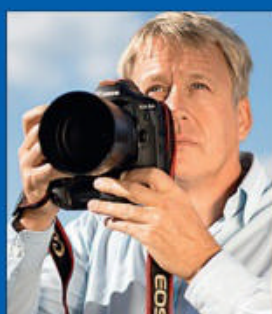


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STEVEN TEE

GP Racing's principal photographer has been focusing on F1 cars since 1984, following in the footsteps of his father, Michael. Steven, MD of Motorsport Images subsidiary LAT, also found time to give us his thoughts on F1's return to Zandvoort, 36 years after his only previous visit



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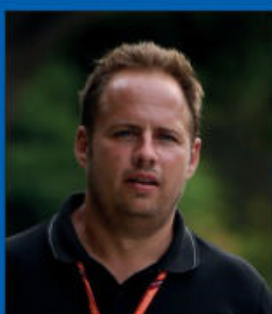
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GLENN DUNBAR

Glenn started working at LAT back in 2002 but, after 18 years, opted to go freelance at the start of 2020. In addition to his regular race weekend duties, Glenn also shoots on behalf of a team, and this season swapped pink for green as Racing Point morphed into Aston Martin



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SAM BLOXHAM

Edinburgh-based Sam started out doing trackday photography before joining LAT in 2013. He became a senior photographer at Motorsport Images in 2021 and, in addition to covering Formula 1, can also be seen snapping away at Formula E and Extreme E events



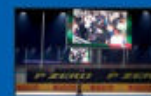
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STEVE ETHERINGTON

Steve started his photographic career in 1977. After working for local and national newspapers, and then a specialist sports agency, in 1997 he went freelance, specialising in F1. Steve has been to well over 400 F1 races and is the official Mercedes F1 team photographer



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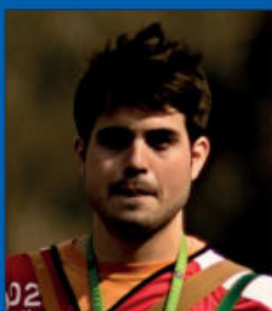
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ZAK MAUGER

After a number of years where he concentrated on Formula 2, Zak has spent more time photographing Formula 1 in the last few seasons, but still keeps his hand in with F2. Born in Guernsey, but now based in London, Zak also covered Formula E and W Series in 2021



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NIGEL ROEBUCK'S F O R M U L A O N E HEROES

ELIO DE ANGELIS

PICTURES  **motorsport
IMAGES**

IN SOME
WAYS, ELIO
DE ANGELIS...

reminded me of Chris Amon. He wasn't as good as Amon – not many were – but he, too, had an abundance of natural ability, and was considered 'too nice a guy'. It was as if God gave them the talent but forgot the ruthlessness. For Elio, like Chris, racing was one of the good things of life, but neither lived like monks. Both smoked, enjoyed a glass or two, were a little disorganised – and both would have had it no other way.

Perhaps upbringing had something to do with it. There was no element here of the boxer from the Bronx tenements looking to fight himself out of poverty. De Angelis, like Amon, was born into a wealthy family and grew up wanting for little. Both began racing at

a young age: Chris was 19 when he made his F1 debut, Elio 20.

By this time the young Roman had been Italian Formula 3 champion, and – more significantly – the winner in 1978 of the Monaco F3 race, in those days highly prestigious. For 1979, he joined the Shadow F1 team, his best finish a fourth at Watkins Glen.

Jo Ramírez was also then working for Shadow, and the two became close friends. "In many ways," Jo remembered, "Elio was like François Cevert. Charming, completely genuine – and, like François, a classically trained pianist. For all his wealth, he was very down-to-earth – the day he signed the contract for his first F1 drive we celebrated in a coffee shop in Northampton called Cagney's, where we had hamburgers and chips!

"I remember a test session at Ricard. The track was wet, and no one wanted to go out, but it had stopped raining, and someone suggested that we all take our hire cars out, and dry the track! I went with Elio, and it was fantastic to watch him – he just floored it all the way round, slowing the car with the steering wheel! Of course, nowadays no one would do anything like that, would they?"

Shadow might have been towards the back of the field, but de Angelis had shown enough in his first season to attract interest from other teams, and for 1980 he joined Lotus, partnering Mario Andretti. The alliance – which would last for six seasons – began well, Elio finishing second at Interlagos, only his second race for the team. In 1982 he claimed his first GP victory, beating Keke Rosberg by a couple of feet at the Österreichring; it would be the last victory of Colin Chapman's life.

By now the turbo era was in full flow, and for 1983 Lotus had engines from Renault. It was a disappointing, unreliable, season, but the following year was much better though: if there were no wins, de Angelis made the podium four times, and finished third in the world championship, well clear of team-mate Nigel Mansell.

De Angelis spent six seasons with Lotus but left when he realised the team had switched its main focus onto Ayrton Senna





Natural talent ensured de Angelis was quick, but the lack of a harder edge perhaps prevented him from achieving greater success

For 1985, though, Mansell moved to Williams, and de Angelis found himself teamed with Ayrton Senna: life was about to change. In the rains of Estoril, his second race with Lotus, Ayrton won supremely, and although Elio took the next grand prix, at Imola – inheriting victory after Alain Prost’s disqualification – to lead the championship, the pattern was already set.

There wasn’t much fun to be had in this scenario, but if the intensity of his new team-mate came as a shock, the talent of de Angelis occasionally asserted itself, as at Montréal, where he beat Senna to pole by 0.249s. I walked back to the paddock with Ayrton that day, and remember his bemusement: “How did he do that time?” he kept saying. “I don’t know how he did that.”

At season’s end, there was not much between them, Senna finishing fourth in the championship with 38 points, de Angelis fifth with 33. Elio, though, had tired of life in what had become emphatically Ayrton’s team, and for 1986 moved to Brabham.

There were high hopes for Gordon Murray’s revolutionary BT55, whose ultra-low profile was achieved by canting over the BMW engine, but it suffered from oil surge problems, and the car was off the pace. After a dispiriting Monaco GP, Brabham went to Ricard for a

De Angelis claimed the first of his two F1 world championship victories at the 1982 Austrian GP



multi-team test session, and there de Angelis lost his life.

He died atrociously. After shedding its rear wing, the Brabham somersaulted over a crash barrier, and came to rest upside down. Although there was fire, it was at the rear of the car, away from the cockpit, and had there been any kind of adequate rescue service, Elio would have suffered only a broken collar bone.

Alan Jones was first on the scene, and when I spoke to him a couple of days later, he was still simmering with rage and sorrow. “The problem was that we just couldn’t right the car because it was too heavy. There were a couple of marshals there in normal clothes – shorts, in fact – and they had these piddling little fire extinguishers which did nothing at all.


“Finally a truck arrived, with a big extinguisher, which at first they couldn’t get to work. Then they stood about eight feet away, and blew all the extinguisher powder in towards the cockpit, and not the engine. That powder will have done Elio no good.

“Ultimately I guess it has to be down to the teams themselves – if we’re not happy with facilities we shouldn’t run – but we just front up, and assume everything’s under control. At a race you have Professor Watkins making sure nothing starts until the helicopter’s arrived, and so on, but testing’s different. On this occasion the helicopter had to come from Marseilles.”

De Angelis, deprived of oxygen and inhaling that powder, was trapped for nearly 10 minutes, and another half-hour passed before the helicopter arrived. The cause of death was asphyxiation.

“It was such a waste of life,” said Ramirez. “Even now it upsets me to think of it, the way he suffered – he was not seriously injured, he just couldn’t breathe. Shameful.”

The death of de Angelis caused both grief and outrage. It was bad enough he had died in an accident not of his own making, worse by far that he should have survived; that attempts to save him were pathetic and inept. It was F1 team personnel, not marshals, who righted his car.

‘Song For Guy’, an Elton John track – no vocal, just piano – composed in memory of a motorcycle messenger, who had worked for Elton and died in a road accident, was a favourite of Elio’s, and played at his funeral. Whenever I hear it, I remember a delightful man, with a lovely sense of humour, and manners from another age. 

IN MANY WAYS
ELIO WAS LIKE
FRANÇOIS CEVERT.
CHARMING,
COMPLETELY
GENUINE – AND,
LIKE FRANÇOIS, A
CLASSICALLY
TRAINED PIANIST

JO RAMÍREZ

THE REBEL AND F1 OF AN

Jacques Villeneuve was an unconventional and mercurial F1 talent who this year celebrates 25 years since becoming world champion. In this candid interview, he explains that skiing taught him everything he knows, how his father's sudden death was the making of him, and why he doesn't like pushy racing dads...

WORDS MARK GALLAGHER
PICTURES  **motorsport**
IMAGES





IF NETFLIX HAD BEEN AROUND

in 1996 it's not hard to imagine a *Drive To Survive*-style docu-series centred on Williams pairing Jacques Villeneuve and Damon Hill. Both sons of famed fathers who died early deaths – Gilles Villeneuve while driving for Ferrari in 1982; Graham Hill in a plane crash shortly after the end of a career that had crowned him world champion twice.

Jacques, fresh from winning the 1995 Champ Car title and Indy 500, would arrive in F1 in spectacular fashion, grabbing pole position in Melbourne on his debut, before indulging in a season-long battle with Williams team-mate Damon for the world championship.

Having finished runner-up to Hill in 1996, the then 25-year-old French Canadian would go one better the following year, claiming the title despite Michael Schumacher's cynical attempt to take him out in the season finale at Jerez – an attempt which would result in the German being disqualified entirely from the championship.

It's now 25 years since Jacques claimed his only F1 title; 40 years since his father was lost to motorsport altogether.

While Gilles' legacy has power-slid its way into the mysticism reserved for those who have died at the wheel, Jacques' has followed an altogether different trajectory. He survived, won a world championship, produced those brilliant early successes followed by a tale of hopes, dreams and perhaps a little frustration.

There is a view that Villeneuve's career somehow stalled; never quite lived up to its billing.

Talk to the man himself and the sense is rather different. He remains passionate about racing, and his victories in the final two rounds of the 2021 NASCAR Euro Series were celebrated with as much enthusiasm as any grand prix win.

Here is a Jacques Villeneuve who looks back on his world title success with satisfaction, but who is equally proud of having helped to establish the team that is now known as Mercedes-AMG F1.

Villeneuve has deeply held opinions about any racing subject you care to mention. At home in Milan, not a million miles from where his father Gilles entered the annals of F1 history as one of Enzo Ferrari's most celebrated drivers, Jacques reflects on how it started: with Gilles...

In his superb autobiography *Watching the Wheels*, Damon Hill writes candidly about growing up in the shadow of a famous father – how he would often be introduced as 'Graham Hill's son' rather than by his own name. Villeneuve somehow never gave the impression of feeling the weight of his father's Formula 1 legacy.

"No, I never did," he says, matter of factly, then surprises by adding, "I think I was under a shadow as long as he was

alive. I was a crybaby with migraines. It was also a different era when fathers loved their daughters but were proud of their sons. It was tough to be a son back then. All I wanted was love, but that didn't happen because I was sent to school in the mountains, living in someone else's home, away from my family and away from my dad."

If fatherly love was in short supply, the opposite was the case when it came to Gilles giving a young Jacques some completely unexpected challenges.

"He made me fly his helicopter when I was 10," Jacques recalls. "You know, he just let it go and said, 'OK, it's your turn.' You're 10, so it's a lot of stress, and that's the only (kind of) memories that I have of him."

"IT WAS ALSO A DIFFERENT ERA WHEN FATHERS LOVED THEIR DAUGHTERS BUT WERE PROUD OF THEIR SONS. IT WAS TOUGH TO BE A SON BACK THEN"





In 1995 Villeneuve won the Indy 500 on his way to the Champ Car title, and signed an F1 deal with Williams for 1996 and 1997

Villeneuve realises that through being challenged by his father, doing things that few parents would throw at their children, he was perhaps being prepared for a future in racing.

“When I was four years old, there’s a picture of me on a snowmobile which was a copy of his racing one,” Jacques adds. “It was a tiny one with a real engine. It’s a picture of me jumping and I’m maybe two feet or three feet in the air. That was already part and parcel of what made me a racer. I decided when I was five years old that’s all I would do, so when people would ask I said, ‘yeah, well, I’ll be racing, I’ll be world champion’. They would laugh at me and I wasn’t even questioning it.”

Gilles Villeneuve’s death during final qualifying for the 1982 Belgian Grand Prix at Zolder impacted on an 11-year-old Jacques in ways which may surprise.

“The fact that he died saved me, I think in that aspect, psychologically, which is a terrible thing to say, but it gave me freedom,” says Villeneuve. “When I went to boarding school after he died it allowed me to grow up. I went from last in class to first within a month. And I was ski racing. Suddenly I became me.”

That love of skiing played a role in introducing Villeneuve to the satisfaction of competing; being ▶

Jacques (below, far right) with father Gilles, mother Joann and sister Melanie at the 1978 Italian GP at Monza





Villeneuve had already attracted attention in F1 circles before he tested for Williams at Silverstone in 1995



Hill (left) commiserates with Villeneuve after the pair had finished one-two, in Hill's favour, in Australia in 1996





In his first F1 race, polesitter Villeneuve led team-mate Hill (above) until a loss of oil pressure six laps from the end

measured against others as well as himself.

“What I did in skiing I brought into racing,” he says. “If we would go and jump some cliffs, I would make sure I would jump a cliff that nobody else could jump just for the sake of it.”

The rhythm that is essential to downhill skiing, transitioning from one gate to the next, taught the young Villeneuve skills that would help when he turned his focus to motor racing.

“Your mind takes over your body,” he says. “You start talking to yourself through the gates and somehow you push yourself because you listen. You hear your voice, you say ‘Oh, OK, I’ll do it’ and it works. All that, I learned in skiing. You’re left on your own to beat the clock.”

The move into car racing came as the result of trying karts, followed by a course at the Jim Russell Racing Drivers School at Mont Tremblant. Outings in a Group N Alfa Romeo in Italy followed, before the break into Italian Formula 3 arrived with Prema Racing.

With funding from tobacco brand Camel, Villeneuve endured a tough baptism. To observers he appeared to struggle, but he is clear about what those early experiences taught him.

“When I started in Formula 3 in Italy I was 17 but looked 15,” he explains. “At Prema, Angelo Rosin, the father, was my engineer and took me under his wing like an adopted kid. That was very helpful, but it was tough, I had some very quick team-mates.”

He knew people were watching him because of who his father was, so he found his career under close scrutiny from the start.

“Think about it,” he says. “Most drivers don’t come with a [famous] father, so you don’t see them being watched in the first two or three years when they’re learning and struggling. When do you hear about them? When they

start winning, when they start saying, ‘look at this new driver’. When someone like me starts, you are being judged as though you already had years of experience!

“At half of the races I did not even qualify, because back then Italian F3 was the strongest F3 series. Year two I got a couple of podiums and was running quicker, year three: a few poles and running out in front.”

Then came some decisive moves, starting with the appointment of a former teacher from College Beausoleil in Villars, Switzerland, as his manager. Craig Pollock would remain at Villeneuve’s side for a decade and a half.

The shift to Japan to drive with Cerumo was a turning point in terms of on-track performances, followed by a move into the North American

Toyota Atlantic series, in which Villeneuve finished third for Forsythe Green in 1993. The faith shown in Villeneuve by Barry Green and engineer Tony Cicale proved to be the catalyst for what followed.

“That was super important because Barry and Tony, the two of them together, had my back,” recalls Villeneuve. “Barry believed in what I could do.”

Green’s belief in Villeneuve was such that he was prepared to risk losing Player’s sponsorship if the tobacco giant insisted on supporting another driver, and it ultimately

resulted in the split with Jerry Forsythe which led to the creation of Team Green.

In 1994, his debut Champ Car season, Villeneuve was Indy 500 Rookie of the Year, and scored his first race win with a closely fought ▶

“SOMEHOW YOU PUSH YOURSELF BECAUSE YOU LISTEN. YOU HEAR YOUR VOICE, YOU SAY ‘OH, OK, I’LL DO IT’ AND IT WORKS. ALL THAT, I LEARNED IN SKIING. YOU’RE LEFT ON YOUR OWN TO BEAT THE CLOCK”

victory over Emerson Fittipaldi and Al Unser Jr at Road America. The following season, 1995, Jacques won the championship with four outright wins, one of which was the Indy 500.

Everyone was now paying attention to 'Villeneuve Jr', including Bernie Ecclestone and Formula 1. With Ecclestone's help, Pollock pulled a deal together with Frank Williams, who offered Villeneuve a Silverstone test.

"The test went well," recalls Villeneuve. "Driving the car in testing was not really complicated. It was easy to adapt. The F1 cars had less horsepower than the Indycars at the time, but the car was lighter, much more nervous and nimble. It was reacting more like a go-kart compared to an Indycar, plus it had more G-force and was braking a lot later."

Villeneuve soon found that team-mate Hill had the car dialled in to his driving style.

"It took me a while to get to Damon's level in qualifying," Villeneuve admits, despite that debut pole. "He really had a good qualifying set-up and I couldn't drive his car. It took me a few races to get up to speed, mostly because I was used to the Indycar way where you never build a big lead, you drive within the limits because you're saving yourself for the Safety Car. In F1 you drove every lap like a qualifying lap compared to Indycar."

Villeneuve's first F1 win came in the European Grand Prix at the Nürburgring, but three more victories followed – in Britain, Hungary and Portugal. It was at Estoril that Villeneuve produced that audacious overtaking manoeuvre in which the Williams swept around the outside of Michael Schumacher's Ferrari at the Parabolica – a move which Villeneuve predicted to race engineer Jock Clear.

The following season, Hill now replaced by Heinz-Harald Frentzen, Villeneuve seamlessly

"F1 WAS AMAZING ON THE QUALI LAP, TO GET THAT PERFECTION WITH THE TEAM. BUT RACING WISE, WHEN YOU GET IN THE NASCAR, I HAVE HARDLY EVER HAD AS MUCH FUN"

assumed the role of team leader, winning seven grands prix – the first of which came in Brazil where Jacques claimed pole from Schumacher by over half a second. Their rivalry built across the season, blow and counter-blow, culminating in that infamous assault by Schumacher at Jerez.

Finishing that race third, his car's battery only just held in place by an electrical cable, Villeneuve claimed the title and ensured his family name would finally be engraved on the world championship trophy.

"It was a big statement," he says. "It happened after I was disqualified from Suzuka [for overtaking under yellow flags] where it gave Michael the championship lead. Everybody thought 'OK, this is Ferrari's championship. It's done'. Nobody thought we would go and win it."

The fact that Villeneuve had dyed his hair blonde mid-season also seemed to unsettle some of the Williams management, and it drew media criticism.

"A lot of them that thought that I had collapsed mentally because I went blonde just after Montréal," Villeneuve says. "They thought I was losing my marbles. Patrick [Head] made a few comments that were tough. Like I made a mess of the season because of one race, Argentina, where I barely beat [Eddie] Irvine in the Ferrari. The fact was that I had not eaten for three days due to a bug."

That Villeneuve would never win another grand prix was down to several factors, starting with both Renault and Adrian Newey moving on from Williams. The 1998 season would net Jacques just two podium finishes.

Then came the momentous decision to set up an F1 team in partnership with Pollock, Reynard Racing Cars and British American Tobacco.

"It was the next challenge," Jacques says simply. "It was masterminded by Craig originally. We had the backing, and at that point I put everything I had earned into making the team. I was heavily invested – I think I owned something like one quarter or a third of the team for a time – so I didn't go there for a salary. It was actually

my team that I built and, ultimately, it's the Mercedes team today."

Although BAR did not achieve its ambitions, Villeneuve points out that after a hugely disappointing debut season the team scored 10 points finishes in 2000 – results which he feels are overlooked.

Villeneuve remained with BAR through five seasons. His regret is that he had an opportunity to leave after three years to join Renault, a contract having been agreed with Flavio Briatore, but that deal was never signed.

"At the moment of signing Craig had a collapse because it meant the whole dream team was collapsing as well. At that moment of weakness, I stayed with BAR instead. That was the first time that I did not follow my gut."

The political landscape within BAR changed in the two seasons that followed, and results remained elusive. Villeneuve moved on. His F1 career would continue with three outings for Renault at the end of 2004 followed by a year and a half driving for Sauber and BMW. It came to a disappointing end after the 2006 German GP.

Although F1 was finished for him, Villeneuve's passion for racing remained (and remains) undiminished. He has driven in sportscars and at Le Mans for Peugeot, raced in GTs, World Rallycross, V8 Supercars, Brazilian Stock Cars and Formula E. But his favourite?

"NASCAR, oh yeah!" he says, smiling. "F1 was amazing on the quali lap, to get that perfection with the team. But racing wise, when you get in the NASCAR, I have hardly ever had as much fun."

Villeneuve spent five seasons at BAR, a team he part-owned for a while, but results were patchy with two podiums from 81 races





At the 1997 European GP David Coulthard (left) and Mika Häkkinen lift Villeneuve to celebrate his title success

After leaving F1, Jacques tried his hand at a lot of other categories and finished second at the 2008 Le Mans 24 Hours



That collision with Schumacher at Jerez in 1997. Jacques continued, Michael didn't, and the title was Villeneuve's



Craig Pollock (above, right) was a huge part of Villeneuve's career, as his manager from 1992 to 2008, and partner at BAR

I think that's also because of the skiing, because the NASCAR is quite a big, heavy, soft car.

"You can drive around the problem. The way you lean on it and attack the corner, if you have some kind of issue, you'll brake a bit harder or less or you throw the car in. I love the racing in NASCAR because it's back to being a gladiator."

These days, perhaps not surprisingly, Villeneuve often gets asked for advice by fathers looking to give their sons a chance to reach Formula 1. He is left cold by the pushy parents.

"For me, that's always been the worst approach you can have because you never know if the kid is really passionate? Does he really want to do it? Or will he say one day, 'Dad, actually I really don't like what I'm doing'?"



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F1 WORLD CHAMPIONSHIP ROUND 22

THE ABU DHABI GP IN 3 KEY MOMENTS



Verstappen celebrates his first world title after snatching victory on a dramatic final lap

1 FIA waves 'play on' as Verstappen lunges and Hamilton goes off

It took less than a lap of the 58 scheduled for 2021's title showdown to get controversial. Red Bull's Max Verstappen had pole for the decider but fluffed his start – "I dropped the clutch and there was just not a lot of grip" – allowing Lewis Hamilton to power past from second on the grid.

Mercedes appeared to have the legs on Red Bull after practice and the first part of qualifying, but an aerodynamic tow from team-mate Sergio Pérez – worth 0.1 seconds – plus what Christian Horner described as "insane" driving from Verstappen in Q3, meant Max to beat Lewis to pole by nearly four tenths of a second.

An earlier mistake in Q2 forced Verstappen to start the race on the softest tyre, while Hamilton began on the medium, so Verstappen's fluffed getaway meant Lewis now had the lead and strategic advantage to go with it.

In this winner-takes-all finale, Verstappen knew he had to act fast. That's surely why he made such an enormous lunge, from way back, down

Hamilton's inside into the tight left-hander at Turn 6.

Yes, Verstappen stayed completely within the white lines (unlike in São Paulo and Jeddah) – but only by denying Hamilton any space to make the corner too. Hamilton cut the second part of the chicane himself to stay ahead. Red Bull complained, but the stewards decreed Max forced Hamilton off, so race director Michael Masi waved 'play on'.

2 Pérez plays his part

Running in clean air and unmolested from behind, Hamilton stretched the W12's legs and pulled away from Verstappen at a rate of more than three tenths per lap, until Red Bull brought Verstappen into the pits for new hard tyres at the end of lap 13. Mercedes covered this by stopping Hamilton for a set of scrubbed hards a lap later.

Advantage Hamilton in the title battle, though Pérez now led the race – meaning he could be deployed as a strategic weapon while Valtteri Bottas languished after a poor qualifying and even worse opening lap.

Red Bull instructed Pérez to deliberately delay Hamilton once the Mercedes reached striking distance. Pérez, on old soft tyres, put up a huge fight through lap 20, re-passing Hamilton into Turn 6, then using DRS to re-pass again into the new, banked Turn 9, then roadblocking Hamilton through the final sector.

Hamilton eventually overtook properly on the run to Turn 6 on lap 21, but the delay cost him somewhere between seven and eight seconds relative to Verstappen. Max called Pérez "a legend", while Pérez himself admitted to conflicted feelings.

It didn't make a huge difference ultimately, as Verstappen would have remained in Hamilton's pit window regardless of Pérez's efforts – but it made for a tense spectacle.

PICTURES: ZAK MAUGER; CHARLES COATES



Pérez's delaying of Hamilton made for good TV but ultimately had little effect on strategy

3 The lap that decided a championship...

The Virtual Safety Car was deployed after Antonio Giovinazzi's Alfa Romeo broke down at the end of his 33rd lap. For laps 36 and 37, the cars ran at reduced speed and Red Bull brought Verstappen into the pits for another set of hard tyres. Mercedes left Lewis out, correctly determining Max would've stayed out and taken the lead had Lewis stopped.

This gave Hamilton a 17s lead to protect over the final 21 laps, and Mercedes told Lewis that Verstappen would need more than eight tenths per lap to have any chance of winning. Hamilton did more than enough, but then Nicholas Latifi crashed his Williams at Turn 13...

The FIA despatched the Safety Car with six laps left. Red Bull stopped Verstappen for soft tyres, anticipating a possible last throw of the dice should a restart take place. Mercedes again left Hamilton out, knowing Verstappen already had fresher tyres so wouldn't need to pit if Lewis did.

Having stated a restart would happen without allowing lapped cars to first overtake the Safety car, as is convention, the FIA changed its mind and specifically instructed the lapped cars now running between Hamilton and Verstappen – Lando Norris, Fernando Alonso, Esteban Ocon, Charles Leclerc and Lance Stroll – to pass the Safety Car on the penultimate lap, while also instructing the Safety Car to return to the pits at the end of that same lap, truncating the usual procedure and creating a one-lap shootout.

On his ageing hard tyres, Hamilton was a sitting duck – though the lunging pass Verstappen made at Turn 5 to win the race and championship was still brilliant in its audacity and precise judgment of grip under braking.

Mercedes made two protests after the flag, alleging Verstappen briefly overtook Hamilton while preparing for the restart, and arguing the FIA failed to respect its own Safety Car procedure which dictates there should be another lap behind the Safety Car once lapped cars have been instructed to overtake it – thus the race should have finished in Safety Car order with Hamilton the winner.

Both were rejected. The first never really stood a chance, but the second appeared valid based on the exact wording of Article 48.12 of F1's sporting regulations. Red Bull argued Article 48.13, which states the Safety Car must come in at the end of the lap the signal it will do so is given, overruled the previous article.

The stewards agreed, and with Red Bull's argument that Article 15.3 gave Masi "overriding authority" over the Safety Car's deployment and withdrawal – basically carte blanche to, in Hamilton's words, 'manipulate' the race by clearing the lapped cars that, in Masi's own words, would "interfere" with the leaders after a restart. Masi also argued the teams had stated their desire for races to finish under racing conditions wherever possible, so felt he was complying with their own wishes.

Having created this one-lap shootout, there was only ever going to be one winner...

Mercedes' stated intention was to appeal to a higher authority, but on December 16 the team opted not to proceed (see Insider).

Lewis would have clinched his eighth title if the race had finished behind the Safety Car...



RESULTS ROUND 22

YAS MARINA / 12.12.21 / 58 LAPS



1st	Max Verstappen	Red Bull	1h30m17.345s
2nd	Lewis Hamilton	Mercedes	+2.256s
3rd	Carlos Sainz	Ferrari	+5.173s
4th	Yuki Tsunoda	AlphaTauri	+5.692s
5th	Pierre Gasly	AlphaTauri	+6.531s
6th	Valtteri Bottas	Mercedes	+7.463s
7th	Lando Norris	McLaren	+59.200s
8th	Fernando Alonso	Alpine	+61.708s
9th	Esteban Ocon	Alpine	+64.026s
10th	Charles Leclerc	Ferrari	+66.057s
11th	Sebastian Vettel	Aston Martin	+67.527s
12th	Daniel Ricciardo	McLaren	+1 lap
13th	Lance Stroll	Aston Martin	+1 lap
14th	Mick Schumacher	Haas	+1 lap
15th	Sergio Pérez	Red Bull	55laps/engine

Retirements

Nicholas Latifi	Williams	50 laps - accident
Antonio Giovinazzi	Alfa Romeo	33 laps - gearbox
George Russell	Williams	26 laps - gearbox
Kimi Räikkönen	Alfa Romeo	25 laps - unsafe release
Nikita Mazepin	Haas	DNS - COVID-19

Fastest lap

Max Verstappen 1m26.103s on lap 39

TYRE COMPOUNDS USED



CLIMATE

Dry/
night



AIR TEMP

25°C

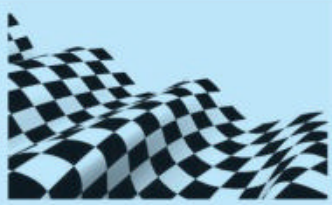
TRACK TEMP

28°C

FINAL DRIVERS' STANDINGS

1 Verstappen	395.5pts	12 Vettel	43pts
2 Hamilton	387.5pts	13 Stroll	34pts
3 Bottas	226pts	14 Tsunoda	32pts
4 Pérez	190pts	15 Russell	16pts
5 Sainz	164.5pts	16 Räikkönen	10pts
6 Norris	160pts	17 Latifi	7pts
7 Leclerc	159pts	18 Giovinazzi	3pts
8 Ricciardo	115pts	19 Schumacher	0pts
9 Gasly	110pts	20 Kubica	0pts
10 Alonso	81pts	21 Mazepin	0pts
11 Ocon	74pts		





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VANWALL

Authors Denis Jenkinson, Cyril Posthumus, Doug Nye

Price £90

porterpress.co.uk

Vanwall wasn't the first team conceived to establish British supremacy in F1 but it, rather than BRM, was the first to win the constructors' championship.

The story of this short-lived racing organisation is a fascinating one and this book, originally published in 1975, is rightly considered a definitive history. Co-author Cyril Posthumus was the associate editor

of *GP Racing's* sister magazine *Autosport* from launch in 1950, while Denis Jenkinson was one of the most lauded racing journalists of his era. This new edition benefits from the addition of a wealth of original documentation, from letters and telegrams to factory technical records, along with period photographs captioned by the eminent racing historian Doug Nye.



GRID LEGENDS

Price £49.99-£79.99 (pre-order only)

ea.com

The fifth entry in EA's GRID racing franchise is the most ambitious yet, featuring a host of new tracks – some based on real life, others entirely fictitious – plus new vehicles from a variety of genres, including electric cars for the first time. Another addition is a 'story mode' for single players, similar to that implemented in

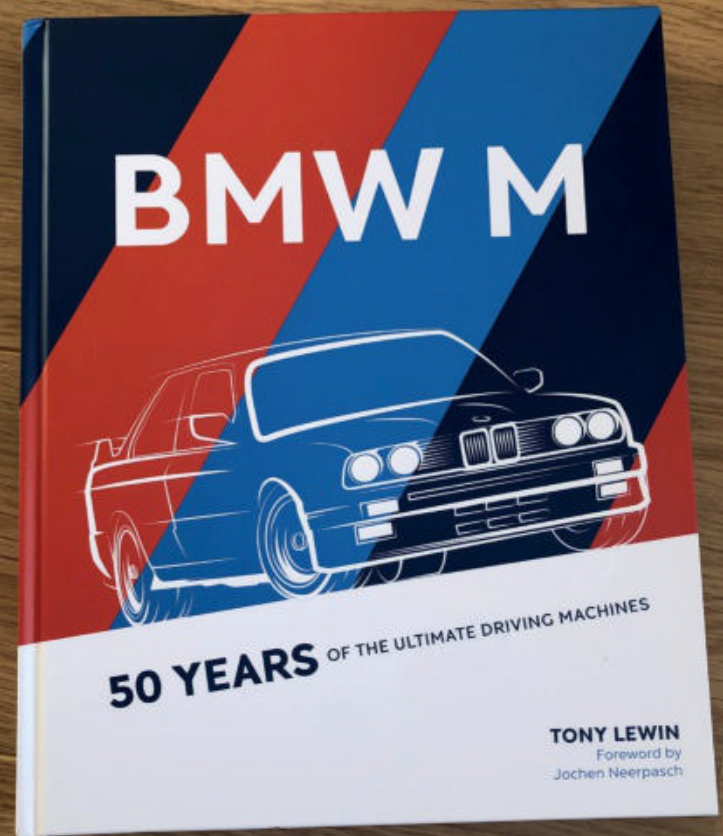
the most recent official F1 games.

New circuits include street layouts in central London and Moscow, touring the major landmarks, and the Strada Alpine, an ultra-fast combination of 'road' and racetrack. There are over 100 vehicles to choose from, including trucks and cars. Formula E-style electric cars



also feature – along with a new race format featuring boost power-ups. GRID games have typically angled towards arcade-style action rather than pitch-perfect sim accuracy. In keeping with that, this new edition includes races in which the last two cars are eliminated every time the counter goes to zero. The developers

claim to have implemented a variety of AI profiles to make the non-human drivers less predictable, including the possibility that some might look for revenge if you've been overly physical when passing them. Players who pre-order the game will receive bonus content and cars, including a Porsche 962.



BMW M

Author Tony Lewin

Price £35

quarto.com

It's now 50 years since BMW launched its Motorsport division, simply known as 'M'. While there are those who feel the Munich marque's marketers have diluted the M badge's value in recent years by offering it up as little more than a cosmetic optional extra, it retains valuable associations with some pretty rarefied machinery.

Tony Lewin's other works include *The Complete Book of BMW* and *The BMW Century*, and this lavish tome – complete with neat embossed cover – acts as a fine companion

piece. BMW launched M to connect its motor racing credentials to its road car range with a series of high-performance production cars. Early highs included the 2002 tii Turbo. While its attempt to create a road-going supercar wasn't entirely successful, the resultant M1 did end up on the F1 support bill. Latterly the M badge has graced a number of hot saloons and SUVs; it must be said, though, that while *GP Racing* staffers venerate the M3 and M5, they cannot endorse the existence of the X6.

DRIVERS ON DRIVERS

Author Philip Porter

Price £30

porterpress.co.uk

Some of the world's top drivers open up about their peers in this compilation of rare interviews featuring eight Formula 1 champions and nine winners of the Le Mans 24 Hours. Published to support the cancer charity Hope for Tomorrow, this extensively illustrated work is the passion project of specialist publisher Philip Porter, who undertook many of the interviews. You'll also find many familiar contributors to *GP Racing* in there, including Peter Windsor, David Tremayne and Ben Edwards.

While the headline acts are appropriately starry – Jackie Stewart on Jim Clark, Gerhard Berger on Ayrton Senna, Tony Brooks on Stirling Moss – there's much to enjoy in the recollections of well-loved names outside the pantheon of grand prix

winners. The interview with Derek Warwick is a hoot, for instance, as he recalls his occasionally dysfunctional relationship with Arrows team-mate Eddie Cheever.

More contemporary names include Lewis Hamilton and Mika Häkkinen, who appears to be thoroughly enjoying his latterday career as a raconteur.





FINISHING STRAIGHT

THE FINAL LAP

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FLAT CHAT

{ FULL THROTTLE
MUSINGS WITH
STUART CODDLING }

PICTURES 

WILLIAMS: A WELCOME WIN (OF SORTS)

One of the most tawdry and unedifying affairs in late-period Formula 1 may be approaching settlement. No, not the FIA race director deciding on an extemporaneous interpretation of the rulebook in Abu Dhabi – that matter is still very much live – but the mysterious case of the missing Williams sponsor.

In May 2020 the venerable grand prix team announced it was parting ways with its recently arrived title sponsor ROKiT, an “innovative, rebellious and proud” (its words) group with interests in everything from telecommunications to e-bikes via beverages and – dread phrase – “content production and distribution”.

It was certainly rebellious when it came to settlement of monies owed. In a series of hearings last year, a London Court of Arbitration tribunal presided over the particulars of the contractual dispute between Williams and its erstwhile sponsor. The filings make for fascinating reading, not least since the first tranche details ROKiT’s

failure to pay its £20,000 share of the court’s advance fees by the due date of 16 March 2021.

This is small change in comparison with the meat of the dispute: \$24.4m which Williams claimed it was contractually owed as payments for the 2020 season, ROKiT having signed (and made initial payments on) a three-year contract from the beginning of the 2019 season which ROKiT quickly extended by another two years. The failure of that money to arrive put the team’s future in jeopardy and ultimately resulted in the Williams family putting it up for sale.

In June 2020 Williams made “a Calderbank offer”, a without-prejudice compromise deal to settle out of court. ROKiT’s solicitors didn’t

When ROKiT stopped paying in 2020, it threatened the very future of Williams



respond. Hence the arbitration procedure, during which Williams also sought to recover the costs of the initial 2020 season branding (with ROKiT) and the subsequent rebranding (without it). Arbitrator Klaus Reichert noted in his ‘final award’ that ROKiT “would have been in a far better legal position” had it accepted the settlement.

The tribunal was also shown a document emailed to Williams on 6 March 2020 “which bears all the indicia of an instruction to a bank to wire \$24,400,000 to the [Williams] bank account”. This was the amount of the invoices the team had sent, plus \$1m ROKiT boss Jonathan Kendrick had verbally agreed with Claire Williams as a bonus via an email in which he had described himself as “blown away” by the success of the partnership. That money never arrived. “A most curious state of affairs,” said the arbitrator.

Reichert was unconvinced by ROKiT’s claims that it failed to pay because Williams was in breach of contract – all the contemporary communications from the company indicated happiness and appeared to be “unambiguously promising” the payments. “To now accept the Respondents’ [ROKiT’s] position, generally,” he concluded, “would require the Sole Arbitrator to suspend any meaningful or evidential approach, and see the matter through a glass, darkly.”

The court sided with Williams to the tune of \$35.7m (the original contractual sum plus damages, interest and costs), which the team is now pursuing through a federal court in California, where part of the ROKiT group is based. Should Williams recover the money it will be a useful windfall for its new owners.

Sponsors who don’t pay – or stop paying – are frustratingly common in F1. In late 2018 Williams was so strapped for cash it nearly went to the altar with the now-notorious Rich Energy. Will the new Concorde Agreement, with its ‘franchise value’ and more equitable sharing of the commercial revenues, make teams less desperate, and less likely to fall prey to fly-by-nights? You have to hope so.

GP Racing has a podcast!

Search for ‘Flat Chat with Codders’ in your podcasting platform of choice.

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